PWU SMT FA training

QSMC PWU EE
Edwin&Summer
2018/6

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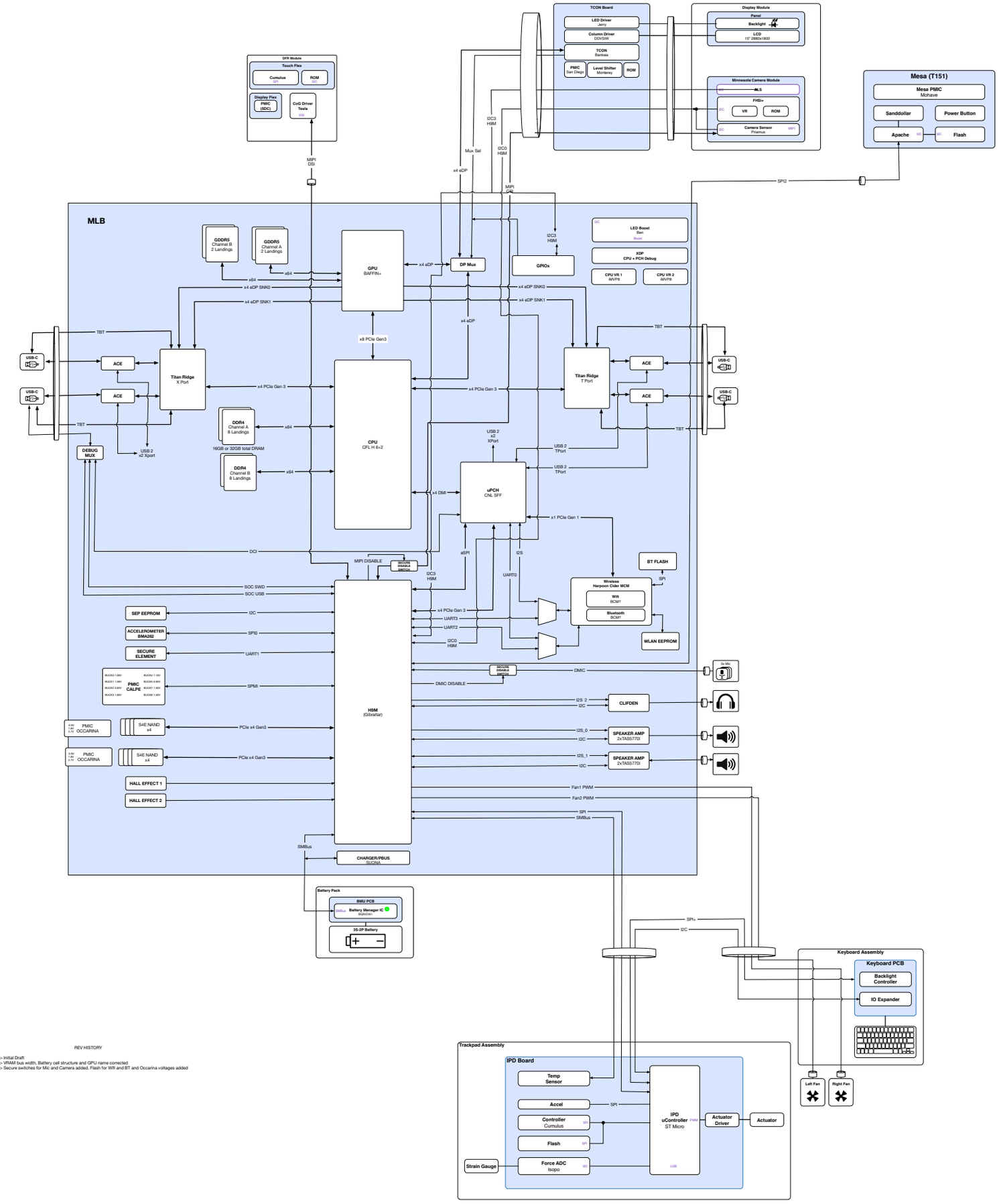
PWU整机架构介绍

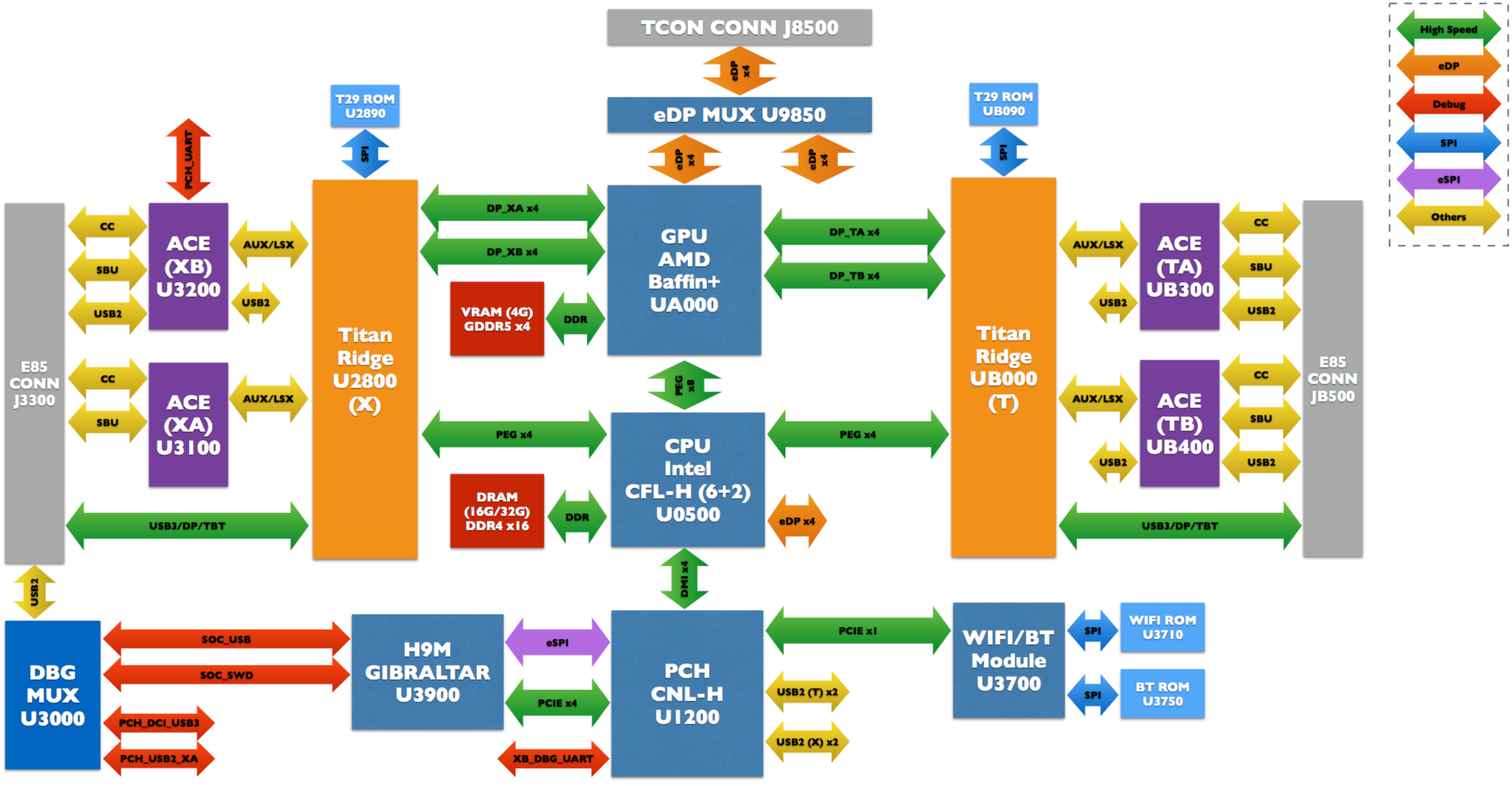


REV HISTORY

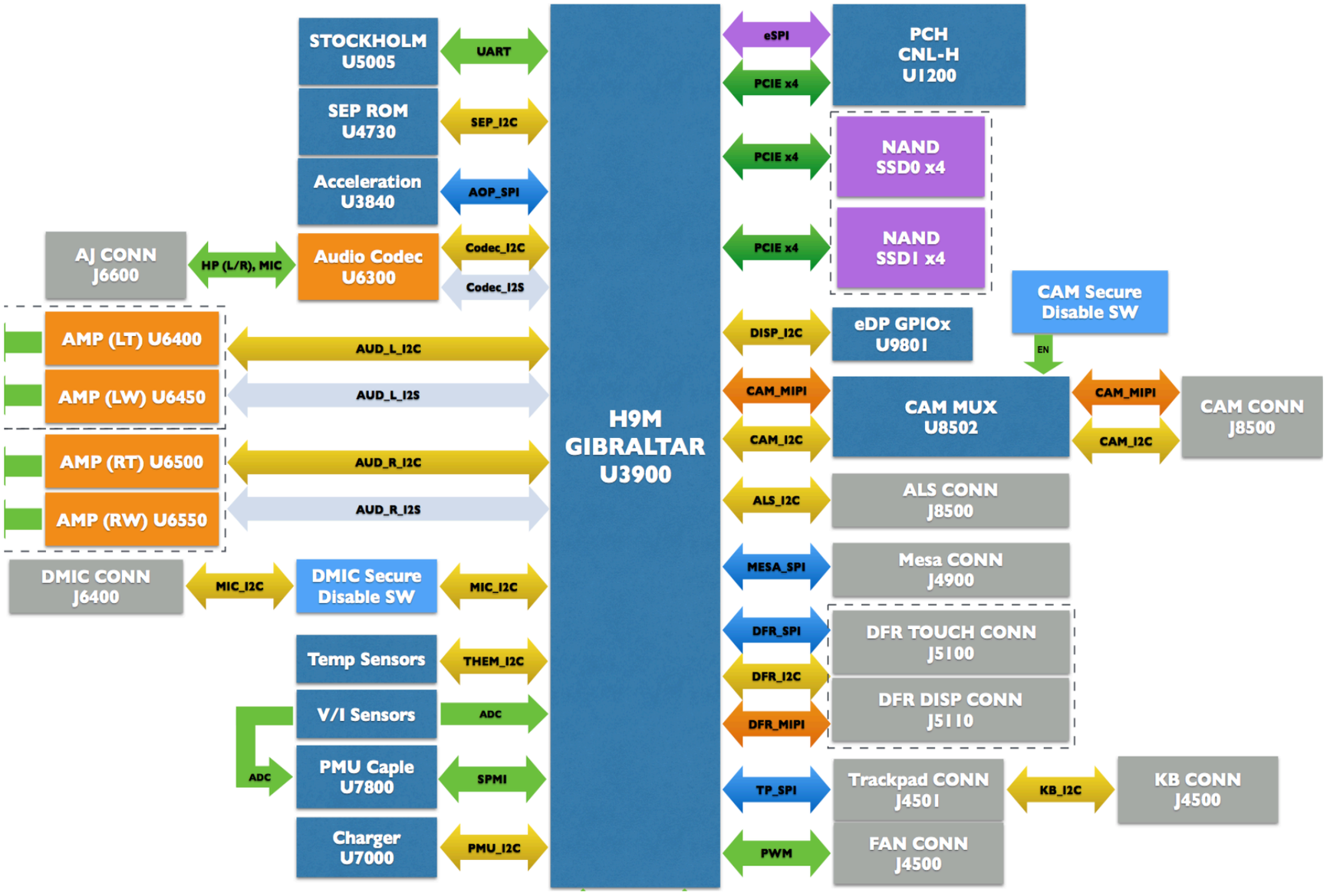
0.1 — > Initial Draft
0.2 — > VRAM bus width, Battery cell structure and GPU name corrected
0.3 — > Secure switches for Mic and Camera added. Flash for Wifi and BT and Occarina voltages added

PWU MLB架构介绍

System Block Diagram | X1181



PWU SOC架构介绍

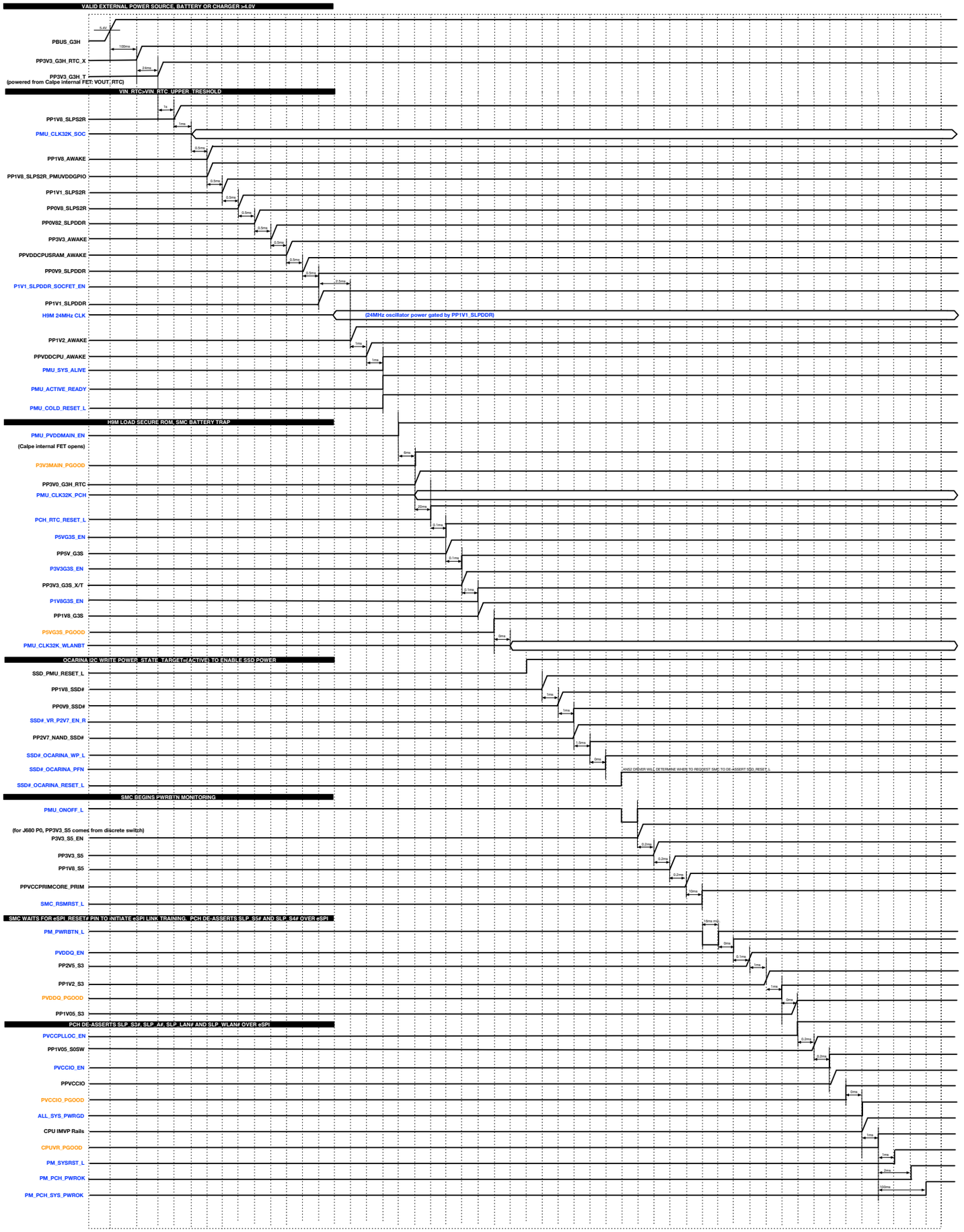


SOC 就是指H9M，location是U3900

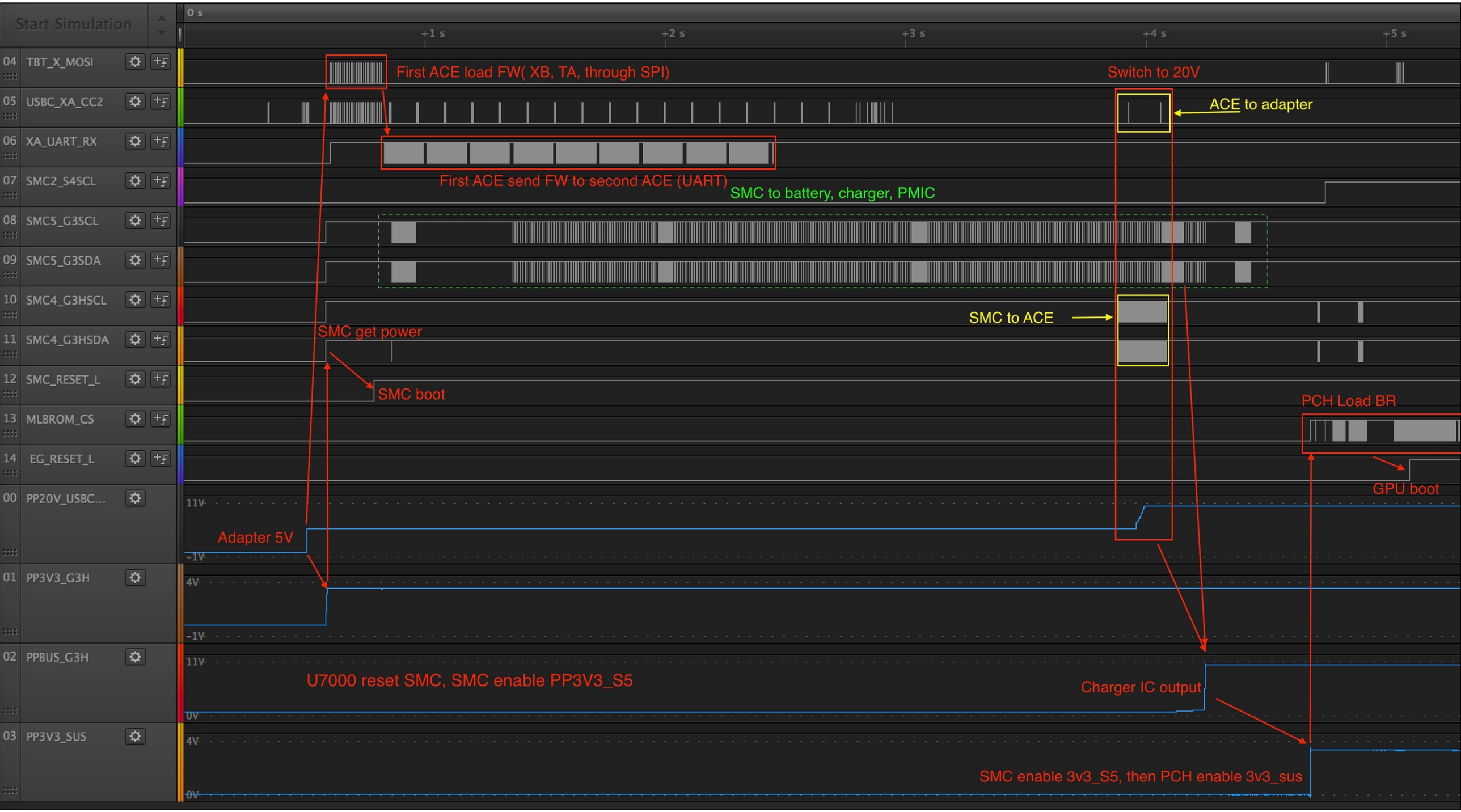
MLB 上电时序介绍：

具体参考附件：

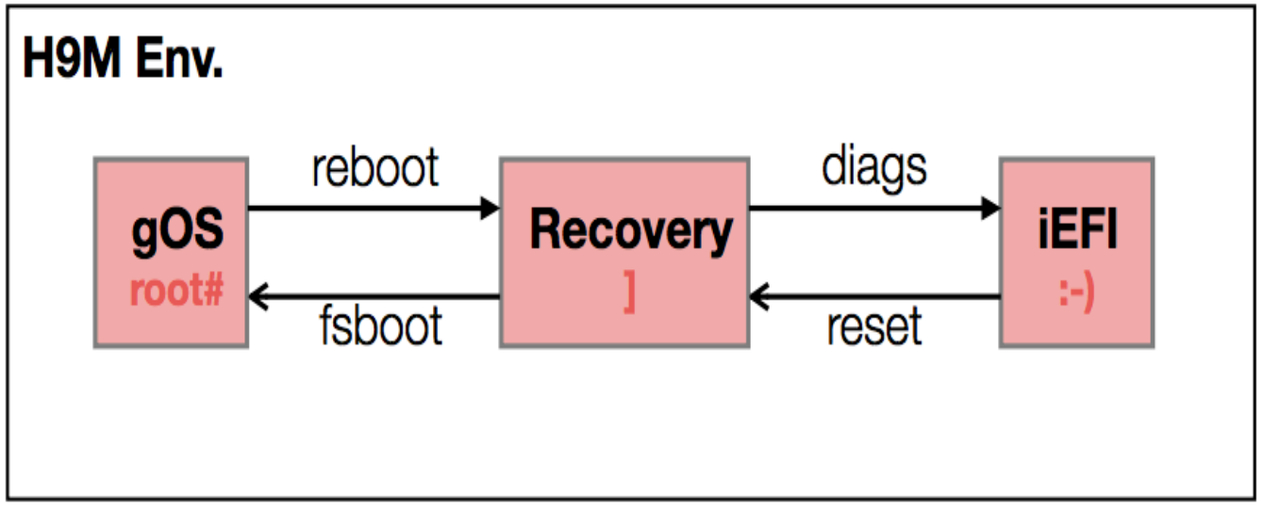
PWU_P0_power_sequencing_v0.1

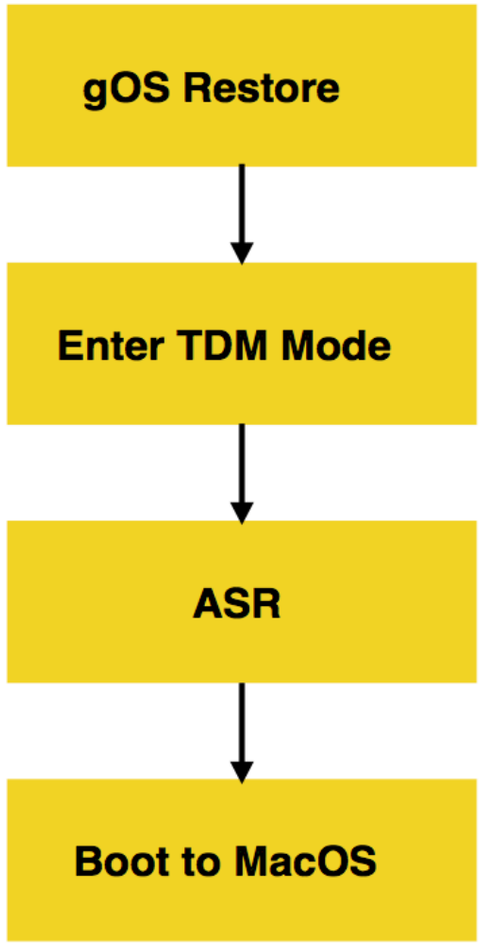


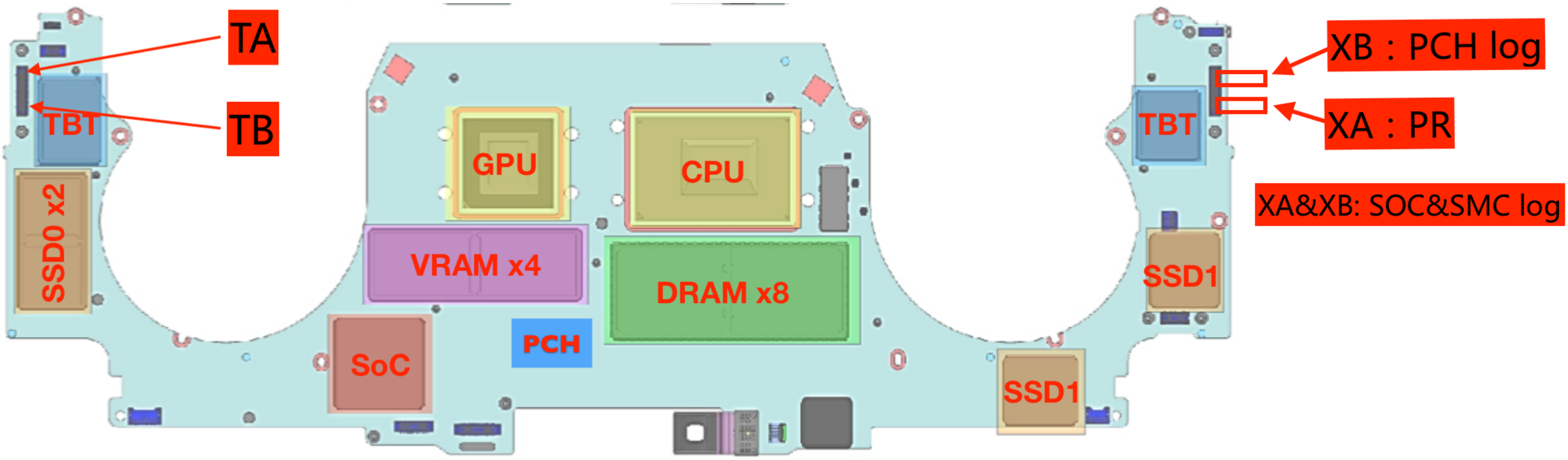
Power On Sequence for Adapter 5V->20V



1.Purple restore 简称 PR， PR之后MLB才能开机
2. SMT DFU station之前的板子均处于DFU模式，PMIC只提供H9M,SSD所需基本power
3. 某些ICT打S3 S0之后的电压fail的板子，需手动restore后才能开机做量测







3、手动PR： 装Overlay系统 & 设置Potassium

3.1:连接Groundhog装DFU station Overlay—>PE/HWTE

3.2: 准备两个Potassium，一个接XA孔做PR，一个接XB孔收PCH log，设置如下

3.2.1、连接**Potassium，**打开terminal输入nanocom, 可以看到

Potassium SN，如右图复制/dev/cu.usbmodem14222

```
Last login: Tue Jun  5 16:26:14 on ttys000
CA4125356:~ edwin$ nanocom
Serial device (a) : /dev/cu.iPhone-WirelessiAP-10
Serial device (b) : /dev/cu.Bluetooth-Incoming-Port
Serial device (]) : /dev/cu.usbmodem14222
Select a device by its letter (^D to abort):
```

3.2.4、第一个Potassium用于PR接XA孔，第二个Potassium**设置如下用于收PCH log， 如右图设置**

/Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 setenv dbg_target 0x0304

/Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 setenv dbg_clock 1250000

nanocom -K -k 200 -y -c 1250000,N,8,1 -d /dev/cu.usbmodem14222

```
Last login: Wed Jun  6 10:06:04 on ttys001
CA4125356:~ edwin$ /Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 setenv dbg_target 0x0304
INFO: ktool version: 0.15
DBG:  Found device!
DBG:  Got Device ID 0xD0020003
INFO: Wrote dbg_target
CA4125356:~ edwin$ /Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 setenv dbg_clock 1250000
INFO: ktool version: 0.15
DBG:  Found device!
DBG:  Got Device ID 0xD0020003
INFO: Wrote dbg_clock
CA4125356:~ edwin$ nanocom -K -k 200 -y -c 1250000,N,8,1 -d /dev/cu.usbmodem14222
setting port speed to 1250000
bound KDP socket to 41139
bound core socket to 0


Welcome to nanocom v1.12, Copyright (c) 2002-2012

Device selected: /dev/cu.usbmodem14222
Communicating at 1250000,N,8,1, No flow control
echo off, newline mapping off, backspace mapping on
KDP UDP Port: 41139
Waiting 20000 microseconds after sending each character
Waiting 200 microseconds after sending each character in UDP packets

Use Ctrl-] for menu
```

恢复原始设置用如下指令：

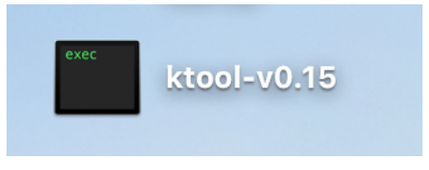
/Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 **setenv dbg_target 0x0206**

3.2.3、**Reset SoC**：将ktool 拖进terminal， 如下

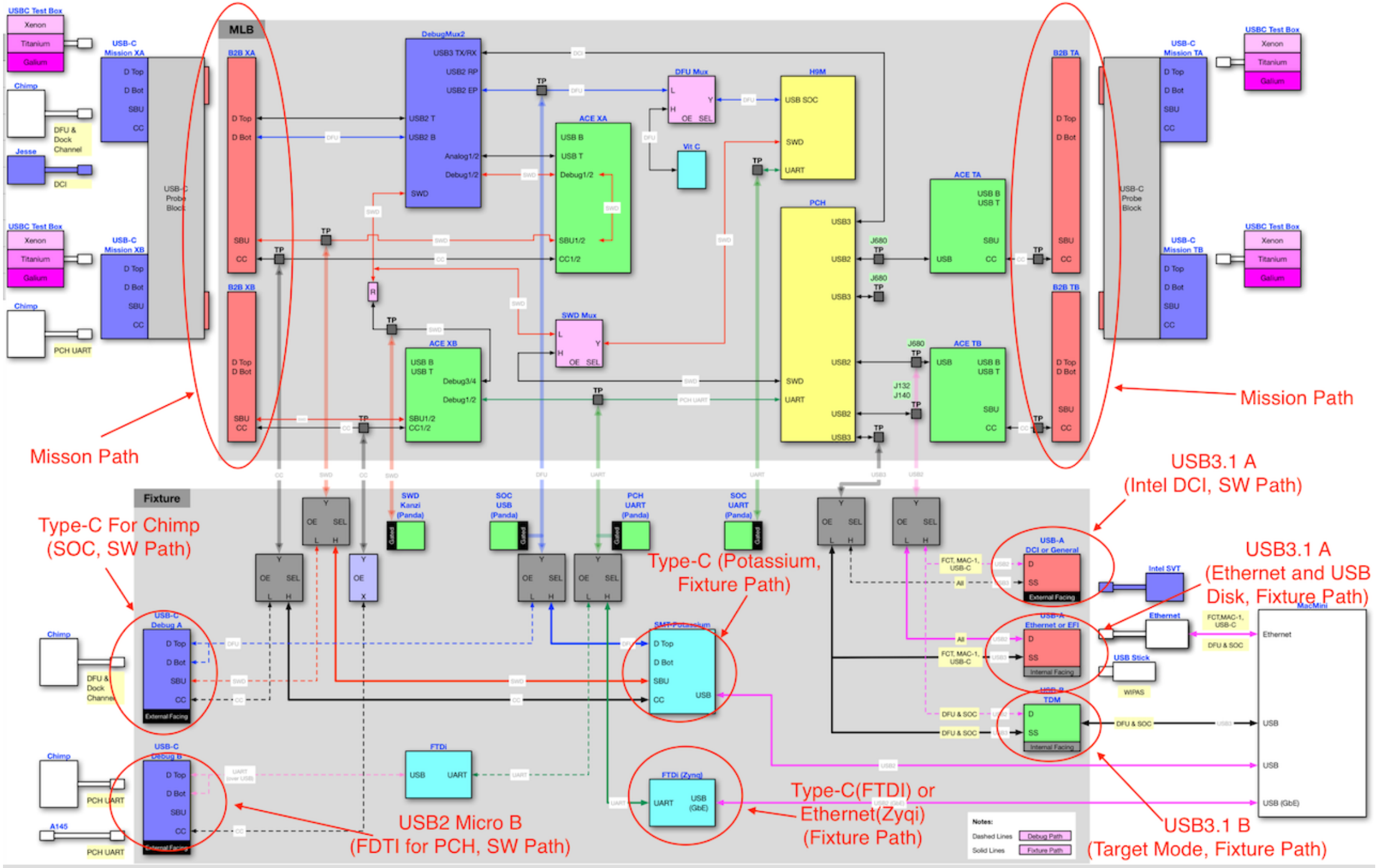
/Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 reset

3.2.2、**Force DFU(恢复到DFU模式)**：将ktool文件拖进terminal输入指令， 如下

/Users/edwin/Desktop/ktool-v0.15 /dev/cu.usbmodem14222 force_dfu

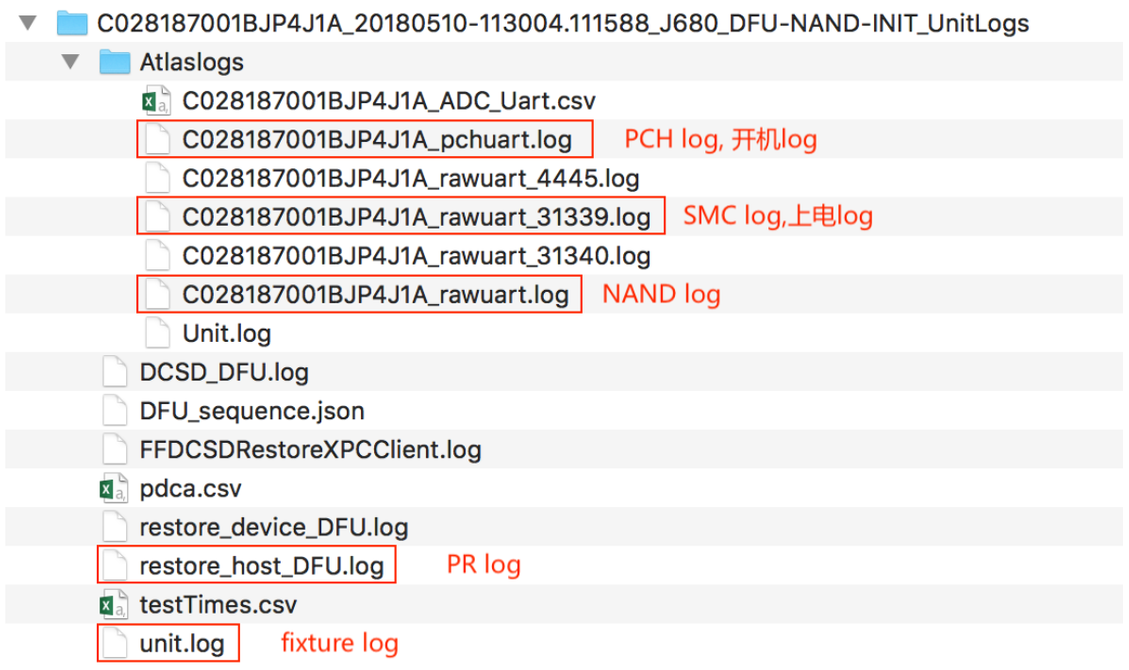


Fixture and MLB debug interface



二、如何看DFU log

PASS log



DCSD fail log

failedItems.csv

使用“Microsoft Excel”打开

testName	subTestName	subSubTestName	value	upperLimit	lowerLimit	units	failureInfo	code	result
DCSD.restore	restore						-1 - AMRestorePerformRestoreModeRestoreWithError failed with error: 2	-3	FAILED

restore_host_DFU.log

显示 现在 清除 重新载入 共享 搜索

```
[21:47:30.8955] Completed checkpoint id: 0x100000653
[21:47:30.9001]   Started checkpoint id: 0x100000666
[21:47:30.9004] <Restore Device 0x7f82f6452350>: operation 36 progress -1
[21:47:30.9005] requested variant: Factory - Software Download
[21:47:30.9023] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: AOP
[21:47:30.9045] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: InputDevice
[21:47:30.9066] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: PERTOS
[21:47:30.9087] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: RBM
[21:47:30.9108] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: MacEFI
[21:47:33.3902] Completed checkpoint id: 0x100000666
[21:47:33.3951]   Started checkpoint id: 0x10000061F
[21:47:33.6774] Completed checkpoint id: 0x10000061F
[21:47:33.6828]   Started checkpoint id: 0x100000621
[21:47:33.6895] <Restore Device 0x7f82f6452350>: operation 11 progress -1
[21:47:33.7319] Completed checkpoint id: 0x100000621
[21:47:33.7381]   Started checkpoint id: 0x100000660
[21:47:33.7434] Completed checkpoint id: 0x100000660
[21:47:33.7488]   Started checkpoint id: 0x622
[21:47:33.7593] Completed checkpoint id: 0x622
[21:47:33.7646]   Started checkpoint id: 0x100000623
[21:47:33.7705] Completed checkpoint id: 0x100000623
[21:47:33.7760]   Started checkpoint id: 0x100000658
[21:47:33.7878] <Restore Device 0x7f82f6452350>: operation 12 progress -1
[21:47:34.4568] Completed checkpoint id: 0x100000658
[21:47:34.4612]   Started checkpoint id: 0x100000659
[21:47:34.4718] Completed checkpoint id: 0x100000659
[21:47:34.4767]   Started checkpoint id: 0x10000065F
[21:47:34.5506] Completed checkpoint id: 0x10000065F
[21:47:34.5555]   Started checkpoint id: 0x100000662
[21:47:34.5601] Completed checkpoint id: 0x100000662
[21:47:34.5625]   Started checkpoint id: 0x66B
[21:47:34.5669] Completed checkpoint id: 0x66B
[21:47:34.5718]   Started checkpoint id: 0x65B
[21:47:34.6379] <Restore Device 0x7f82f6452350>: operation 13 progress 0
[21:53:43.9191] Restore completed, status:2
[21:53:43.9191] Restore Checkpoint Fingerprint: 065B.0000
[21:53:43.9191] Failure Description:
[21:53:43.9191] Depth:0 Code:-1 Error:AMRestorePerformRestoreModeRestoreWithError failed with error: 2
[21:53:43.9191] Depth:1 Code:2 Error:Failed to handle data request message
[21:53:43.9191] Depth:2 Code:2 Error:Failed to handle image request
[21:53:43.9063] AMRAuthInstallDeletePersonalizedBundle
[21:53:43.9063] removed personalized bundle
[21:53:43.9063] <Restore Device 0x7f82f6452350>: Restore failed (result = 2)
[21:53:43.9063] AMRestorePerformRestoreModeRestoreWithError failed with error: 2
[21:53:43.9063] Finished RestoreOS Restore Phase: Failed
[21:53:43.9063] State Machine Dump, status:ERROR - [state:DFU remaining-cycles:1] -> [state:Recovery remaining-cycles:0] -> [state:RestoreOS remaining-cycles:0 (current state)]
```

PR时板子会开机到Apple logo, 在这个位置上电开不到Apple logo则会fail

三、DFU不良分类

1、checkDeviceinDFU

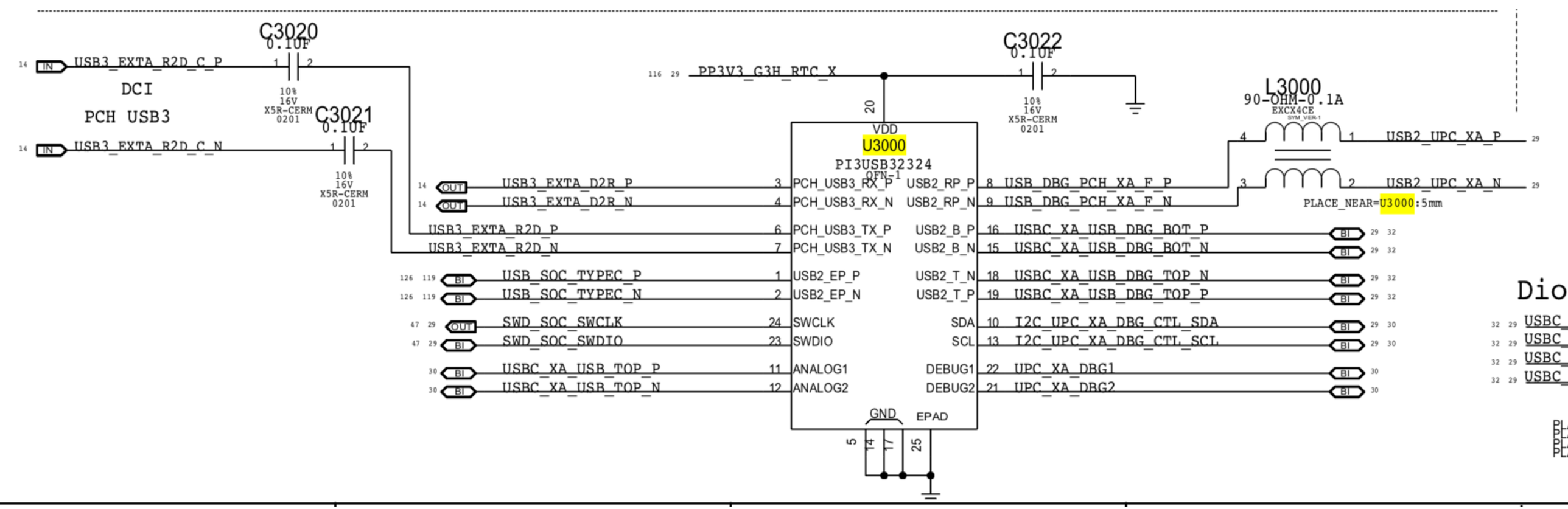
“checkDeviceinDFU” 往往是MLB在DFU里不上电—>打ICT
ICT pass则检查是否XA孔认不到SOC(Mac-mini PR看不到”DFU”)
列举此不良的案例：

<rdar://problem/34563066> J680 Proto1 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main10 (C027375003DJGLN1X) [Material][C3503] [Panasonic]
<rdar://problem/35652913> J680 Proto2 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main14 (C027467000JJLTJ1E) [Material][bad QA350] [Master]
<rdar://problem/35655772> J680 Proto2 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main14 (C0274670019JLTJ1L) [Material][Bad U7660]
<rdar://problem/35672569> J680 Proto2 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main14 (C027467001CJLTJ1H)[Material][bad QA350]
<rdar://problem/35678409> J680 Proto2 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main14 (C027467004MJLTJ1Z) [Material][U7660]
<rdar://problem/35686494> J680 Proto2 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main14 (C027467005JJLTJ1Z) [Material][Bad U7660]
<rdar://problem/36938830> J680 PreEVT DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, Main1 (C028043000KJP4H1P)[Process][U6450 Solder Bridge]
<rdar://problem/38821828> J680 EVT M25 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, KB3 (C0281250001JP5G18)[process][D3301 reversed]
<rdar://problem/40121719> J680 DVT M35 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, DES1 (C028187000UJP4H1X)[Material][C6974] [KEMET 150uF cap][PP3V3_G3H_RTC_X short]
<rdar://problem/40211140> J680 DVT M35 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, DES6 (C0281960010JP841M) [Material][CA321 33uF][Panasonic 33uF cap]
<rdar://problem/40211130> J680 DVT M35 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, DES9 (C028196000HJP7H1X)[Material][CA616 burnt] [Panasonic 33uF cap]

识别不到DFU?

MLB在DFU fixture里认不到DFU mode，检查USB XA孔

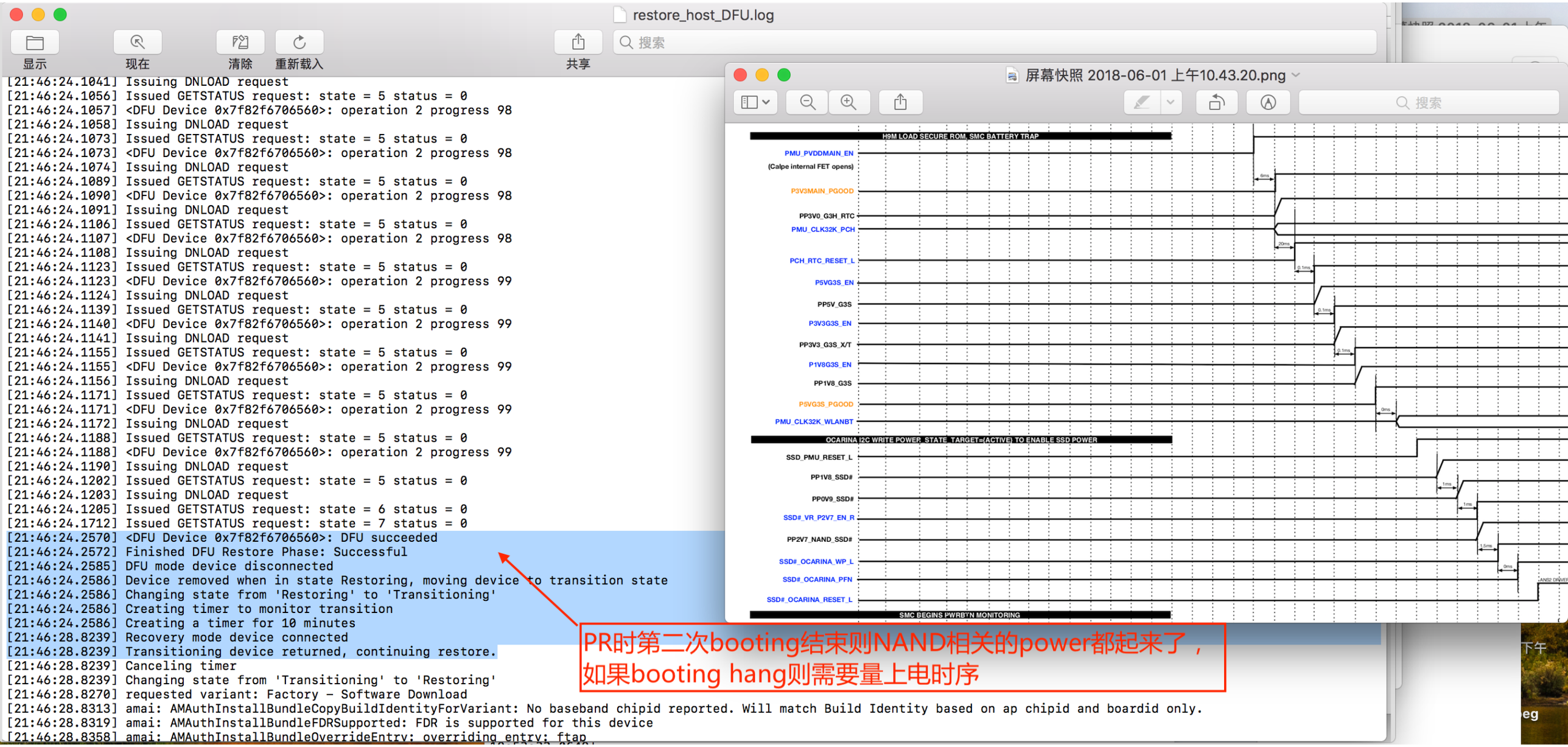
例1： <rdar://problem/38903098> J680 EVT M25 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, KB1 (C028125003BJP4P1K) [Process][U3000 solder bridge]
例2： <rdar://problem/38903109> J680 EVT M25 DFU-NAND-INIT: system.checkDeviceinDFU/checkDeviceinDFU, KB1 (C0281250041JP4P1S) [Process][U3000 solder bridge]



2、DCSD fail

1、通过看log确定是哪种类型fail

1.1、H9M PMU NAND power 问题，手动PR时会在第二次booting hang,


restore_host_DFU.log
显示
现在
清除
重新载入
共享
搜索
[21:46:24.1041] Issuing DNLOAD request
[21:46:24.1056] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1057] <DFU Device 0x7f82f6706560>: operation 2 progress 98
[21:46:24.1058] Issuing DNLOAD request
[21:46:24.1073] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1073] <DFU Device 0x7f82f6706560>: operation 2 progress 98
[21:46:24.1074] Issuing DNLOAD request
[21:46:24.1089] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1090] <DFU Device 0x7f82f6706560>: operation 2 progress 98
[21:46:24.1091] Issuing DNLOAD request
[21:46:24.1106] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1107] <DFU Device 0x7f82f6706560>: operation 2 progress 98
[21:46:24.1108] Issuing DNLOAD request
[21:46:24.1123] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1123] <DFU Device 0x7f82f6706560>: operation 2 progress 99
[21:46:24.1124] Issuing DNLOAD request
[21:46:24.1139] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1140] <DFU Device 0x7f82f6706560>: operation 2 progress 99
[21:46:24.1141] Issuing DNLOAD request
[21:46:24.1155] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1155] <DFU Device 0x7f82f6706560>: operation 2 progress 99
[21:46:24.1156] Issuing DNLOAD request
[21:46:24.1171] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1171] <DFU Device 0x7f82f6706560>: operation 2 progress 99
[21:46:24.1172] Issuing DNLOAD request
[21:46:24.1188] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1188] <DFU Device 0x7f82f6706560>: operation 2 progress 99
[21:46:24.1190] Issuing DNLOAD request
[21:46:24.1202] Issued GETSTATUS request: state = 5 status = 0
[21:46:24.1203] Issuing DNLOAD request
[21:46:24.1205] Issued GETSTATUS request: state = 6 status = 0
[21:46:24.1712] Issued GETSTATUS request: state = 7 status = 0
[21:46:24.2570] <DFU Device 0x7f82f6706560>: DFU succeeded
[21:46:24.2572] Finished DFU Restore Phase: Successful
[21:46:24.2585] DFU mode device disconnected
[21:46:24.2586] Device removed when in state Restoring, moving device to transition state
[21:46:24.2586] Changing state from 'Restoring' to 'Transitioning'
[21:46:24.2586] Creating timer to monitor transition
[21:46:24.2586] Creating a timer for 10 minutes
[21:46:28.8239] Recovery mode device connected
[21:46:28.8239] Transitioning device returned, continuing restore.
[21:46:28.8239] Canceling timer
[21:46:28.8239] Changing state from 'Transitioning' to 'Restoring'
[21:46:28.8270] requested variant: Factory - Software Download
[21:46:28.8313] amai: AMAuthInstallBundleCopyBuildIdentityForVariant: No baseband chipid reported. Will match Build Identity based on ap chipid and boardid only.
[21:46:28.8319] amai: AMAuthInstallBundleFDRSupported: FDR is supported for this device
[21:46:28.8358] amai: AMAuthInstallBundleOverrideEntry: overriding entry: ftap
屏幕快照 2018-06-01 上午10.43.20.png
搜索
H9M LOAD SECURE ROM, SMC BATTERY TRAP
PMU_PVDDMAIN_EN
(Calpe internal FET opens)
P3V3MAIN_PGOOD
PP3V0_G3H_RTC
PMU_CLK32K_PCH
PCH_RTC_RESET_L
P5VG3S_EN
PP5V_G3S
P3V3G3S_EN
PP3V3_G3S_X/T
P1V8G3S_EN
PP1V8_G3S
P5VG3S_PGOOD
PMU_CLK32K_WLANBT
OCARINA I2C WRITE POWER_STATE_TARGET=(ACTIVE) TO ENABLE SSD POWER
SSD_PMU_RESET_L
PP1V8_SSD#
PP0V9_SSD#
SSD#_VR_P2V7_EN_R
PP2V7_NAND_SSD#
SSD#_OCARINA_WP_L
SSD#_OCARINA_PFN
SSD#_OCARINA_RESET_L
SMC BEGINS PWRBTN MONITORING
PR时第二次booting结束则NAND相关的power都起来了，
如果booting hang则需要量上电时序

2、DCSD fail

2.1 NAND PCIe link up fail

1、首先量测NAND周围电压，每一颗NAND有些电压是独立的，需要单独量靠近NAND端的电压

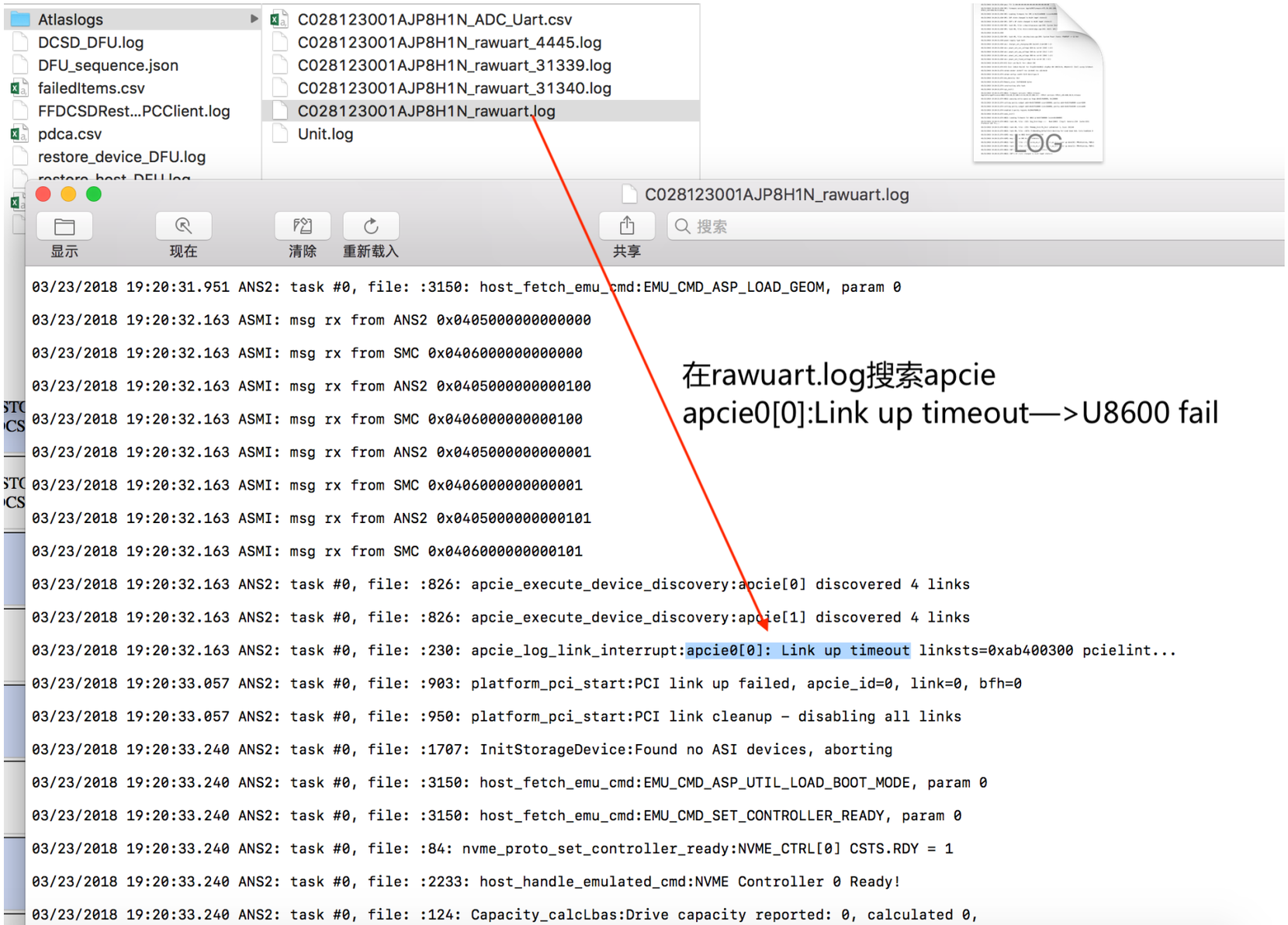
2、看rawuart.log， 寻找关键字：apcie[0] & apcie[1]

例：<rdar://problem/38816938> J680 EVT M25 DFU-NAND-INIT: DCSD.restore/DCSD restore Restore, Main20 (C028123001AJP8H1N)[Suspec NAND][Samsung 4TB]

SSD0:
U9000提供PP0V9_SSD0
PP1V8_SSD0
U9080提供PP2V5_NAND_SSD0

SSD1:
U9500提供PP0V9_SSD1
PP1V8_SSD1
U9580提供PP2V5_NAND_SSD1

apcie0[0]:U8600
apcie0[1]:U8700
apcie0[2]:U8800
apcie0[3]:U8900
apcie1[0]:U9100
apcie1[1]:U9200
apcie1[2]:U9300
apcie1[3]:U9400


Atlaslogs
DCSD_DFU.log
DFU_sequence.json
failedItems.csv
FFDCSDRest...PCClient.log
pdca.csv
restore_device_DFU.log
C028123001AJP8H1N_ADC_Uart.csv
C028123001AJP8H1N_rawuart_4445.log
C028123001AJP8H1N_rawuart_31339.log
C028123001AJP8H1N_rawuart_31340.log
C028123001AJP8H1N_rawuart.log
Unit.log
LOG
C028123001AJP8H1N_rawuart.log
显示
现在
清除
重新载入
共享
搜索
在rawuart.log搜索apcie
apcie0[0]:Link up timeout—>U8600 fail
03/23/2018 19:20:31.951 ANS2: task #0, file: :3150: host_fetch_emu_cmd:EMU_CMD_ASP_LOAD_GEOM, param 0
03/23/2018 19:20:32.163 ASMI: msg rx from ANS2 0x0405000000000000
03/23/2018 19:20:32.163 ASMI: msg rx from SMC 0x0406000000000000
03/23/2018 19:20:32.163 ASMI: msg rx from ANS2 0x0405000000000100
03/23/2018 19:20:32.163 ASMI: msg rx from SMC 0x0406000000000100
03/23/2018 19:20:32.163 ASMI: msg rx from ANS2 0x0405000000000001
03/23/2018 19:20:32.163 ASMI: msg rx from SMC 0x0406000000000001
03/23/2018 19:20:32.163 ASMI: msg rx from ANS2 0x0405000000000101
03/23/2018 19:20:32.163 ASMI: msg rx from SMC 0x0406000000000101
03/23/2018 19:20:32.163 ANS2: task #0, file: :826: apcie_execute_device_discovery:apcie[0] discovered 4 links
03/23/2018 19:20:32.163 ANS2: task #0, file: :826: apcie_execute_device_discovery:apcie[1] discovered 4 links
03/23/2018 19:20:32.163 ANS2: task #0, file: :230: apcie_log_link_interrupt:apcie0[0]: Link up timeout linksts=0xab400300 pcielint...
03/23/2018 19:20:33.057 ANS2: task #0, file: :903: platform_pci_start:PCI link up failed, apcie_id=0, link=0, bfh=0
03/23/2018 19:20:33.057 ANS2: task #0, file: :950: platform_pci_start:PCI link cleanup - disabling all links
03/23/2018 19:20:33.240 ANS2: task #0, file: :1707: InitStorageDevice:Found no ASI devices, aborting
03/23/2018 19:20:33.240 ANS2: task #0, file: :3150: host_fetch_emu_cmd:EMU_CMD_ASP_UTIL_LOAD_BOOT_MODE, param 0
03/23/2018 19:20:33.240 ANS2: task #0, file: :3150: host_fetch_emu_cmd:EMU_CMD_SET_CONTROLLER_READY, param 0
03/23/2018 19:20:33.240 ANS2: task #0, file: :84: nvme_proto_set_controller_ready:NVME_CTRL[0] CSTS.RDY = 1
03/23/2018 19:20:33.240 ANS2: task #0, file: :2233: host_handle_emulated_cmd:NVME Controller 0 Ready!
03/23/2018 19:20:33.240 ANS2: task #0, file: :124: Capacity_calcLbas:Drive capacity reported: 0, calculated 0,

2.3、PR过程中，如若log显示进程停在“operation 13 progress”过程中，则视作X86 boot fail。

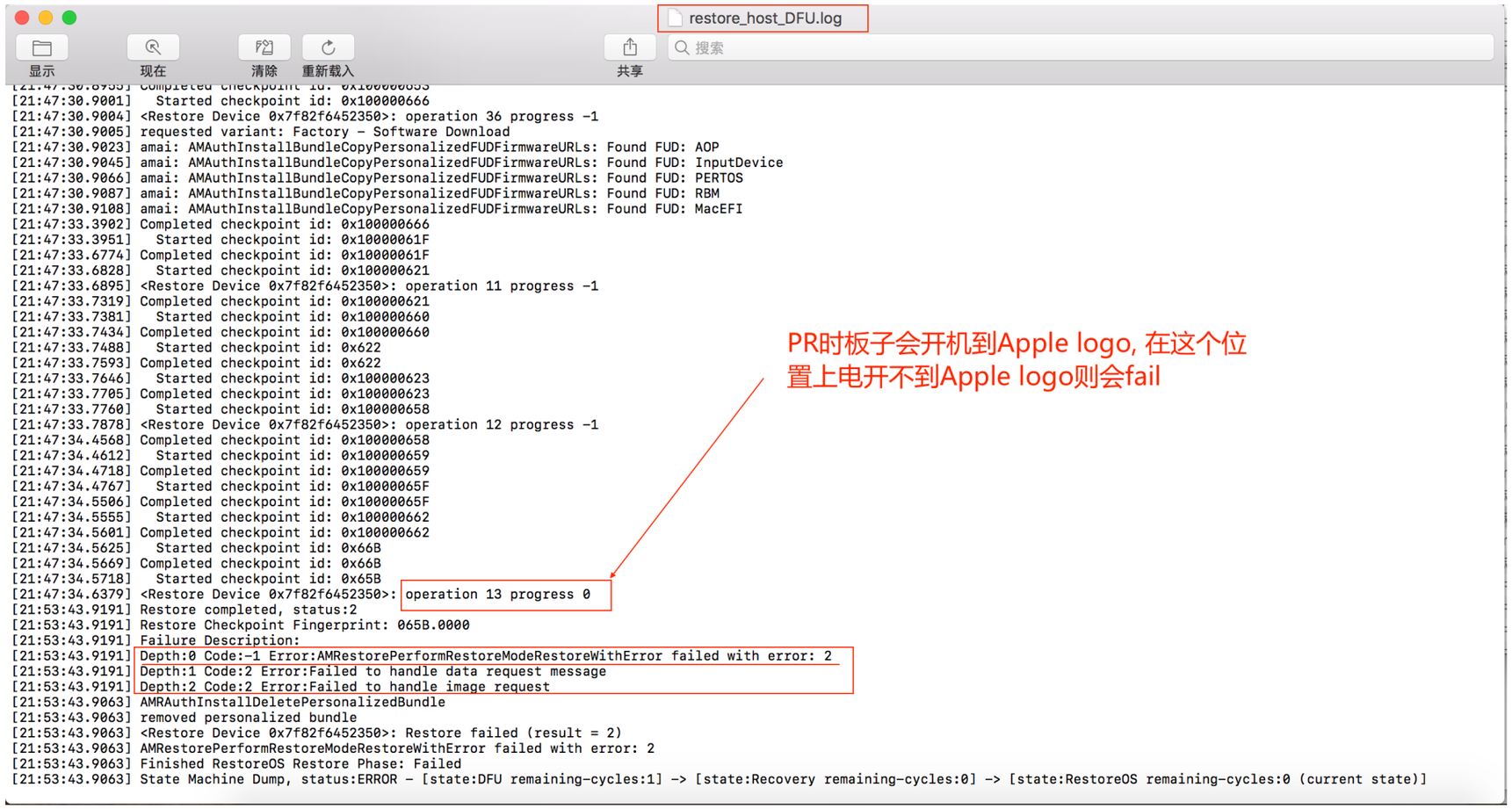
FA 方案：

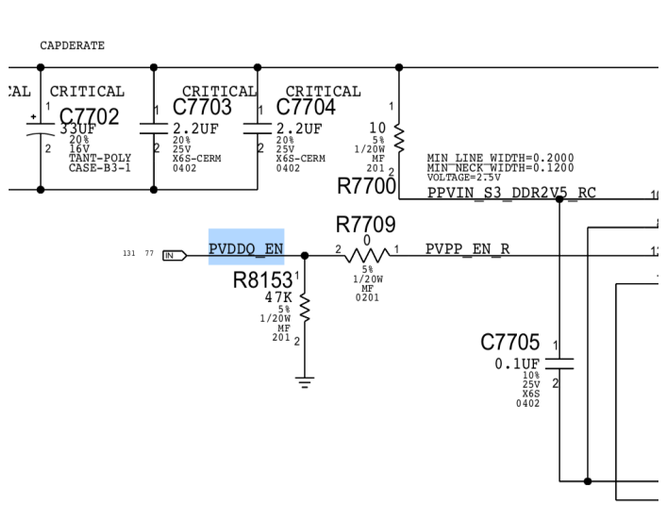
方案1：MLB在bench上用XA做PR，XB收PCH log，通过mojo log post code来判断方向。

方案2：disable x86 boot 做PR， PR成功后，收PCH log，SMC log 来判断方向。

HW disable x86 boot 方法：手动PR时 short PVDDQ_EN to GND

以上两种方案实施之后，后续进一步的分析则需要借助ICT，B-SCAN，power sequence量测。


restore_host_DFU.log
显示
现在
清除
重新载入
共享
搜索
[21:47:30.9001] Started checkpoint id: 0x100000666
[21:47:30.9004] <Restore Device 0x7f82f6452350>: operation 36 progress -1
[21:47:30.9005] requested variant: Factory - Software Download
[21:47:30.9023] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: AOP
[21:47:30.9045] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: InputDevice
[21:47:30.9066] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: PERTOS
[21:47:30.9087] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: RBM
[21:47:30.9108] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: MacEFI
[21:47:33.3902] Completed checkpoint id: 0x100000666
[21:47:33.3951] Started checkpoint id: 0x10000061F
[21:47:33.6774] Completed checkpoint id: 0x10000061F
[21:47:33.6828] Started checkpoint id: 0x100000621
[21:47:33.6895] <Restore Device 0x7f82f6452350>: operation 11 progress -1
[21:47:33.7319] Completed checkpoint id: 0x100000621
[21:47:33.7381] Started checkpoint id: 0x100000660
[21:47:33.7434] Completed checkpoint id: 0x100000660
[21:47:33.7488] Started checkpoint id: 0x622
[21:47:33.7593] Completed checkpoint id: 0x622
[21:47:33.7646] Started checkpoint id: 0x100000623
[21:47:33.7705] Completed checkpoint id: 0x100000623
[21:47:33.7760] Started checkpoint id: 0x100000658
[21:47:33.7878] <Restore Device 0x7f82f6452350>: operation 12 progress -1
[21:47:34.4568] Completed checkpoint id: 0x100000658
[21:47:34.4612] Started checkpoint id: 0x100000659
[21:47:34.4718] Completed checkpoint id: 0x100000659
[21:47:34.4767] Started checkpoint id: 0x10000065F
[21:47:34.5506] Completed checkpoint id: 0x10000065F
[21:47:34.5555] Started checkpoint id: 0x100000662
[21:47:34.5601] Completed checkpoint id: 0x100000662
[21:47:34.5625] Started checkpoint id: 0x66B
[21:47:34.5669] Completed checkpoint id: 0x66B
[21:47:34.5718] Started checkpoint id: 0x65B
[21:47:34.6379] <Restore Device 0x7f82f6452350>: operation 13 progress 0
[21:53:43.9191] Restore completed, status:2
[21:53:43.9191] Restore Checkpoint Fingerprint: 065B.0000
[21:53:43.9191] Failure Description:
[21:53:43.9191] Depth:0 Code:-1 Error:AMRestorePerformRestoreModeRestoreWithError failed with error: 2
[21:53:43.9191] Depth:1 Code:2 Error:Failed to handle data request message
[21:53:43.9191] Depth:2 Code:2 Error:Failed to handle image request
[21:53:43.9063] AMRAuthInstallDeletePersonalizedBundle
[21:53:43.9063] removed personalized bundle
[21:53:43.9063] <Restore Device 0x7f82f6452350>: Restore failed (result = 2)
[21:53:43.9063] AMRestorePerformRestoreModeRestoreWithError failed with error: 2
[21:53:43.9063] Finished RestoreOS Restore Phase: Failed
[21:53:43.9063] State Machine Dump, status:ERROR - [state:DFU remaining-cycles:1] -> [state:Recovery remaining-cycles:0] -> [state:RestoreOS remaining-cycles:0 (current state)]
PR时板子会开机到Apple logo, 在这个位置上电开不到Apple logo则会fail



例：<rdar://problem/40741817> J680 YVB Build M35 DFU-NAND-INIT: [DCSD.restore/DCSD restore Restore] DFU - True Fail, YVB (C02821600U8JP4G1P)[TBD][Memory ChA]

收PCH log方法：手动PR的过程中，XA孔连接Mac-mini做PR，XB孔用Potassium连接电脑收PCH log, 可以看到fail位置指向memory, 再测BSCAN

restore_host_DFU.log

显示 现在 清除 重新载入 共享 搜索

```
[21:47:30.9001]   Started checkpoint id: 0x100000666
[21:47:30.9004] <Restore Device 0x7f82f6452350>: operation 36 progress -1
[21:47:30.9005] requested variant: Factory - Software Download
[21:47:30.9023] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: AOP
[21:47:30.9045] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: InputDevice
[21:47:30.9066] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: PERTOS
[21:47:30.9087] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: RBM
[21:47:30.9108] amai: AMAuthInstallBundleCopyPersonalizedFUDFirmwareURLs: Found FUD: MacEFI
[21:47:33.3902] Completed checkpoint id: 0x100000666
[21:47:33.3951]   Started checkpoint id: 0x10000061F
[21:47:33.6774] Completed checkpoint id: 0x10000061F
[21:47:33.6828]   Started checkpoint id: 0x100000621
[21:47:33.6895] <Restore Device 0x7f82f6452350>: operation 11 progress -1
[21:47:33.7319] Completed checkpoint id: 0x100000621
[21:47:33.7381]   Started checkpoint id: 0x100000660
[21:47:33.7434] Completed checkpoint id: 0x100000660
[21:47:33.7488]   Started checkpoint id: 0x622
[21:47:33.7593] Completed checkpoint id: 0x622
[21:47:33.7646]   Started checkpoint id: 0x100000623
[21:47:33.7705] Completed checkpoint id: 0x100000623
[21:47:33.7760]   Started checkpoint id: 0x100000658
[21:47:33.7878] <Restore Device 0x7f82f6452350>: operation 12 progress -1
[21:47:34.4568] Completed checkpoint id: 0x100000658
[21:47:34.4612]   Started checkpoint id: 0x100000659
[21:47:34.4718] Completed checkpoint id: 0x100000659
[21:47:34.4767]   Started checkpoint id: 0x10000065F
[21:47:34.5506] Completed checkpoint id: 0x10000065F
[21:47:34.5555]   Started checkpoint id: 0x100000662
[21:47:34.5601] Completed checkpoint id: 0x100000662
[21:47:34.5625]   Started checkpoint id: 0x66B
[21:47:34.5669] Completed checkpoint id: 0x66B
[21:47:34.5718]   Started checkpoint id: 0x65B
[21:47:34.6379] <Restore Device 0x7f82f6452350>: operation 13 progress 0
[21:53:43.9191] Restore completed, status:2
[21:53:43.9191] Restore Checkpoint Fingerprint: 065B.0000
[21:53:43.9191] Failure Description:
[21:53:43.9191] Depth:0 Code:-1 Error:AMRestorePerformRestoreModeRestoreWithError failed with error: 2
[21:53:43.9191] Depth:1 Code:2 Error:Failed to handle data request message
[21:53:43.9191] Depth:2 Code:2 Error:Failed to handle image request
[21:53:43.9063] AMRAuthInstallDeletePersonalizedBundle
[21:53:43.9063] removed personalized bundle
[21:53:43.9063] <Restore Device 0x7f82f6452350>: Restore failed (result = 2)
[21:53:43.9063] AMRestorePerformRestoreModeRestoreWithError failed with error: 2
[21:53:43.9063] Finished RestoreOS Restore Phase: Failed
[21:53:43.9063] State Machine Dump, status:ERROR - [state:DFU remaining-cycles:1] -> [state:Recovery remaining-cycles:0] -> [state:RestoreOS remaining-cycles:0 (current state)]
```

PR时板子会开机到Apple logo, 在这个位置上电开不到Apple logo则会fail

未命名 ("C02821600U8JP4G1P PCH log"的副本)

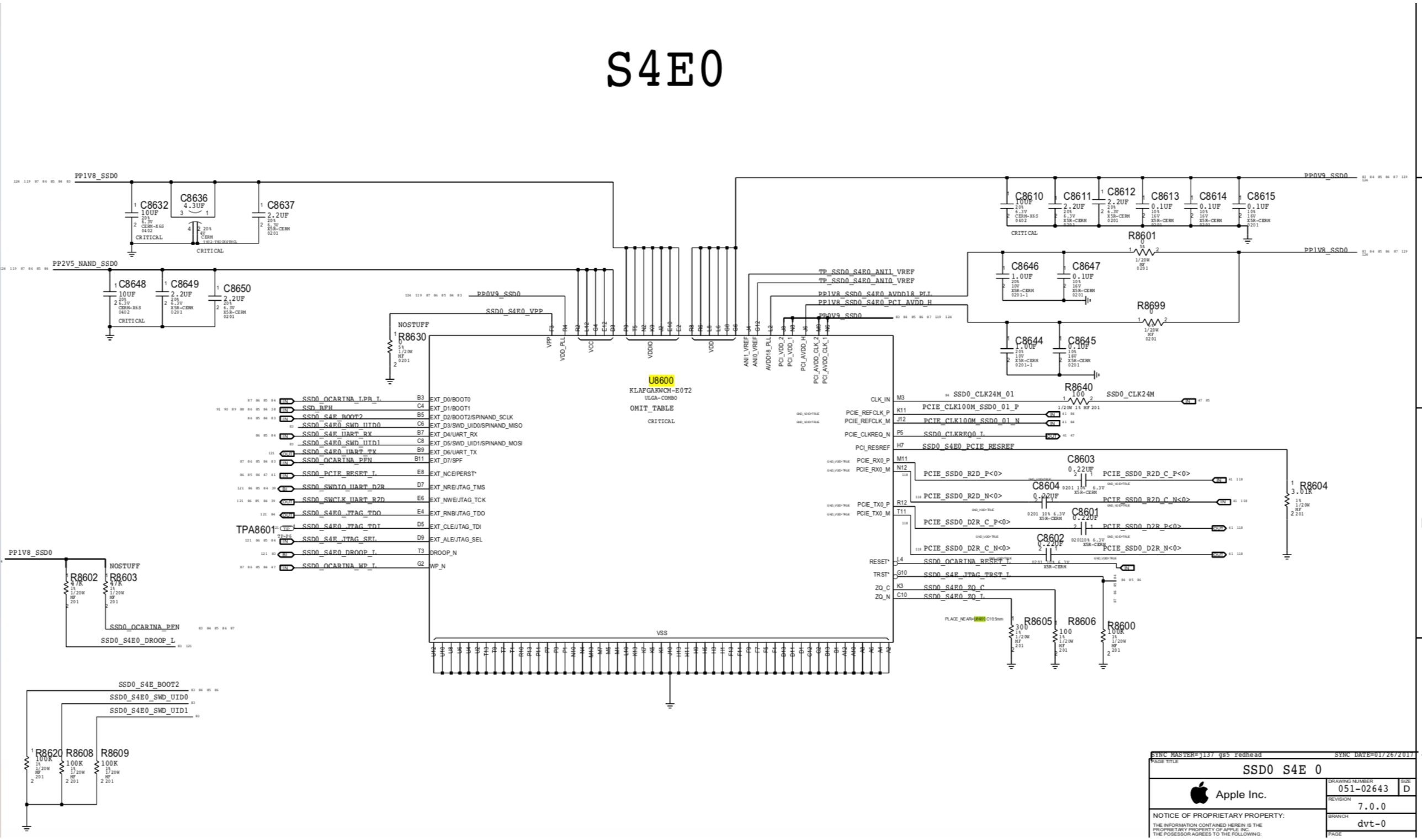
```
14:36:23.3406|[P006] 36544866-6D93-7A48-88FB-669582D2516B
14:36:23.3434|[P007] D9CF9BEB-86D9-11E4-91D0-B8E8562CBAFA
14:36:23.3540|[P008] 2943220C-BC8D-457B-9533-20979FEC8318
14:36:23.3655|[P009] 649760C0-B779-4383-93E9-0C7F9416A6DA
14:36:23.3687|[P010] 2FAC2694-400C-480C-844F-4EC474DD3A2B
14:36:23.3694|[P011] 3FB1A55F-DDEF-42D9-8FAF-891039769F8D
14:36:23.3699|[P012] EEEE611D-F78F-4FB9-B868-55907F169280
14:36:24.5679|[P013] 89E549B0-7CFE-449D-9BA3-10D8B2312D71
14:36:24.5686|[P014] A8499E65-A6F6-48B0-96DB-45C266030D83
14:36:24.6369|!0x0000dd00
14:36:24.6408|!0x0000dd1e
14:36:24.6409|!0x0000dd20
14:36:24.6449|!0x0000dd21
14:36:24.6453|!0x0000dd22
14:36:24.6456|!0x0000dd23
14:36:24.6495|!0x0000dd24
14:36:24.6501|!0x0000dd26
14:36:24.6526|!0x0000dd27
14:36:24.6536|!0x0000dd29
14:36:24.6562|!0x0000dd4c
14:36:24.8692|!0x0000dd2b
14:36:24.8764|!0x0000dd2a
14:36:24.8898|!0x0000dd2c
14:36:24.9045|!0x0000ddff

14:36:24.9046|ASSERT_EFI_ERROR (Status = Device Error)

14:36:24.9051|ASSERT Vendor/Intel/IntelCnl/IntelCannonLakeSiliconPkg/SystemAgent/
MemoryInitCfl/Library/Private/PeiMemoryInitLib/MemoryInit.c:919 : !EFI_ERROR
(((RETURN_STATUS)(0x80000000 | (7))))

14:36:24.9067|Exception 3 occurred
14:36:24.9069|================================================================================
14:36:24.9075|CS  =     0x0010 EIP = 0xffe7b99e  EC = 0x00000000
14:36:24.9080|EFL = 0x00000046 id vip vif ac vm rf nt o d i t s Z a P c
14:36:24.9086|EAX = 0x00000000 DR0 = 0x00000000 CR0 = 0x00000013 DS = 0x0018
14:36:24.9091|EBX = 0x00000000 DR1 = 0x00000000 CR1 = 0x00000000 ES = 0x0018
14:36:24.9097|ECX = 0xffec1582 DR2 = 0x00000000 CR2 = 0x00000000 FS = 0x0018
14:36:24.9103|EDX = 0xffec14d8 DR3 = 0x00000080 CR3 = 0x00000000 GS = 0x0018
14:36:24.9108|ESI = 0xffe7a50f DR6 = 0xffff0ff0 CR4 = 0x00040608 SS = 0x0018
14:36:24.9114|EDI = 0x80000007 DR7 = 0x200004c0
14:36:24.9117|EBP = 0xff73dcc0
14:36:24.9120|ESP = 0xff737738
14:36:24.9120|IDT = 0xff73fb5c/0x010f
14:36:24.9123|GDT = 0xffffda58/0x003f
14:36:24.9125|================================================================================
```

PR过程中开机，但是memory Init. fail, 导致PR中断

3、PR过程中NAND FW update fail

3.1:跳过NAND FW update

3.2:量测NAND端电压



4、PR 时 Update Stockholm fail （U5005）

在bench上PR观察.pr App table界面，fail会出现在update Stockholm的过程中。

<rdar://problem/34506941> J680 Proto1 DFU-NAND-INIT DCSD.restore Main4 C0273740021JGLJ1H update_stockholm: NfRestore Failed [Material][U5005]
<rdar://problem/40211151> J680 DVT M35 DFU-NAND-INIT: DCSD.restore/restore, DES5 (C0281960006JPCM1P)[Process][U5005 Solder Open]
<rdar://problem/40016706> J680 DVT M35 DFU-NAND-INIT: DCSD.restore/restore, Main2B (C028185001GJP8M1S) [Process][U5005 solder open]
<rdar://problem/40016720> J680 DVT M35 DFU-NAND-INIT: DCSD.restore/restore, Main2B (C028185002CJP8M1T)[Process][U5005 solder open]
<rdar://problem/40479538> J680 DVT M35 DFU-NAND-INIT: DCSD.restore/restore, PH1b (C0282050031JP4P10)[Suspect Process][U5005]
<rdar://problem/40479550> J680 DVT M35 DFU-NAND-INIT: DCSD.restore/restore, PH1c (C028205000FJP7T1G) [Suspect Process][U5005]
<rdar://problem/40205246> J680 DVT M35 DFU-NAND-INIT: DCSD.restore/restore, 17aRel (C028196000FJP501N)[Process][Foreign material under U5005]
<rdar://problem/35786953> J680 Proto2 DFU-NAND-INIT: DCSD.restore/restore, Main18 (C027475001SJLTK11) [Process][U5005 rework fail]

restore_host_DFU.log

显示 现在 清除 重新载入 共享 搜索

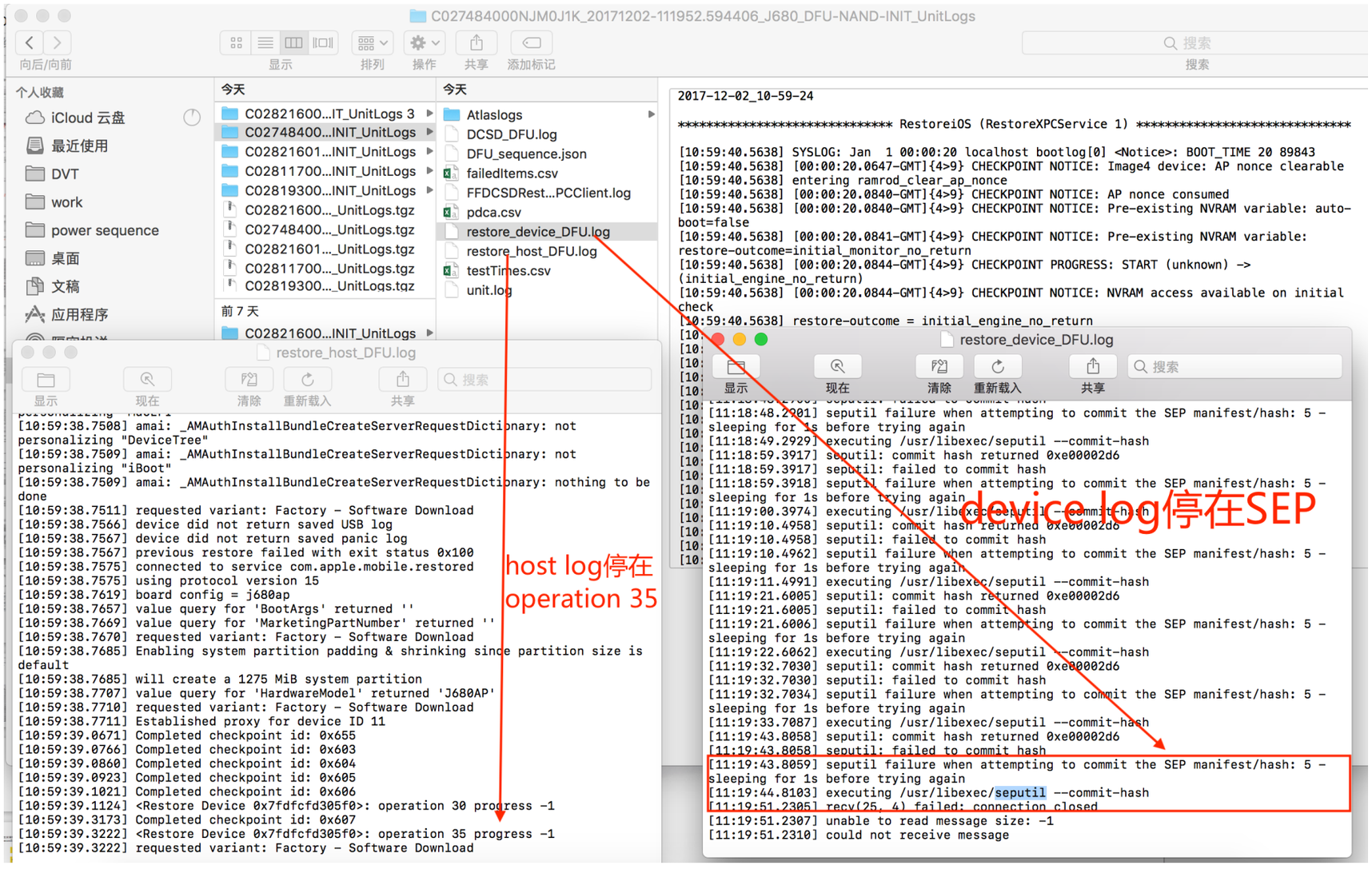
```
[16:21:07.0078] [08:20:48.0841-GMT]{4>8} CHECKPOINT END: RESTORED:[0x0647] cleanup_check_result
[16:21:07.0078] restore-step-ids = {0x11030635:70;0x11031304:72}
[16:21:07.0078] restore-step-names = {0x11030635:update_device_firmware;0x11031304:update_stockholm}
[16:21:07.0078] restore-step-uptime = 106
[16:21:07.0078] restore-step-user-progress = 79
[16:21:07.0078] [08:20:48.0848-GMT]{4>8} CHECKPOINT BEGIN: RESTORED:[0x0648] cleanup_send_final_status
[16:21:07.0078] restore-step-ids = {0x11030635:70;0x11031304:72;0x11030648:74}
[16:21:07.0078] restore-step-names = {0x11030635:update_device_firmware;0x11031304:update_stockholm;0x11030648:cleanup_send_final_status}
[16:21:07.0078] restore-step-uptime = 106
[16:21:07.0078] restore-step-user-progress = 79
[16:21:07.0078] ep-user-progress = 79
[16:21:07.0078]
[16:21:07.0078] ==== end of device restore output ====
[16:21:07.0107] AMRAuthInstallDeletePersonalizedBundle
[16:21:07.0197] removed personalized bundle
[16:21:07.0198] <Restore Device 0x7fff07f00260>: Restore failed (result = 56)
[16:21:07.0198] Finished RestoreOS Restore Phase: Failed
[16:21:07.0198] State Machine Dump, status:ERROR - [state:DFU remaining-cycles:1] -> [state:Recovery remaining-cycles:0] -> [state:RestoreOS remaining-
cycles:0 (current state)]
[16:21:07.0217] Changing state from 'Restoring' to 'Error'
[16:21:07.0217] State is now set to error
[16:21:07.0217] Can't search 0 registry node for serial device
[16:21:07.0219] Restore completed, status:56
[16:21:07.0219] Restore Checkpoint Fingerprint: 1304.FFFF
[16:21:07.0219] Failure Description:
[16:21:07.0219] Depth:0 Code:-1 Error:AMRestorePerformRestoreModeRestoreWithError failed with error: 56
[16:21:07.0219] Depth:1 Code:56 Error:Failed to handle message type StatusMsg
[16:21:07.0219] Depth:2 Code:56 Error:failed to update device firmware
[16:21:07.0219] Depth:3 Code:56 Error:ramrod firmware update failed
[16:21:07.0219] Depth:4 Code:1007 Error:update_stockholm: NfRestore Failed. NfResult: 9
[16:21:07.0219] Depth:5 Code:255 Error:Error 0x00ff at NFRestoreNfc:1180: 8af835004800a01 Tx2f000101Rx4f0001Rx00Rx-Abort
```

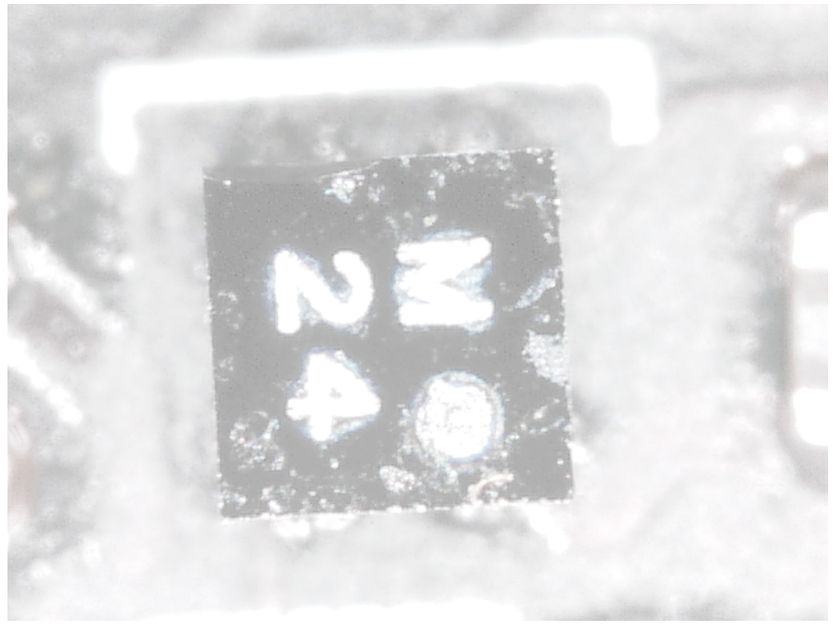
5、PR 时 SEP fail

<rdar://problem/34450562> J680 Proto1 DFU-NAND-INIT: DFU NAND Init/Device Firmware Update Restore, Mini1 C0273660003JGLF1R [Process][U4730 shift]
<rdar://problem/35813232> J680 Proto2 DFU-NAND-INIT: DFU NAND Init/Device Firmware Update Restore, Main32 (C027484000NJM0J1K) [Duplicate to 35822927][Process][U4730 damaged]
<rdar://problem/35822927> J680 Proto2 DFU-NAND-INIT: DFU NAND Init/Device Firmware Update Restore, Main32 (C027484000QJM0J1H) [Master][Process][U4730 damaged]
<rdar://problem/35813229> J680 Proto2 DFU-NAND-INIT: DFU NAND Init/Device Firmware Update Restore, Main32 (C027484000RJM0J1G)[Duplicate to 35822927][Process][U4730 damaged]
<rdar://problem/35813223> J680 Proto2 DFU-NAND-INIT: DFU NAND Init/Device Firmware Update Restore, Main32 (C027484000SJM0J1F) [Duplicate to 35822927][Process][U4730 damaged]

例：<rdar://problem/35813232> J680 Proto2 DFU-NAND-INIT: DFU NAND Init/Device Firmware Update Restore, Main32 (C027484000NJM0J1K) [Duplicate to 35822927][Process][U4730 damaged]

device log停在SEP***， 发现SEP ROM U4730 damage


C027484000NJM0J1K_20171202-111952.594406_J680_DFU-NAND-INIT_UnitLogs
向后/向前
显示
排列
操作
共享
添加标记
搜索
个人收藏
iCloud 云盘
最近使用
DVT
work
power sequence
桌面
文稿
应用程序
今天
C02821600...IT_UnitLogs 3
C02748400...INIT_UnitLogs
C02821601...INIT_UnitLogs
C02811700...INIT_UnitLogs
C02819300...INIT_UnitLogs
C02821600..._UnitLogs.tgz
C02748400..._UnitLogs.tgz
C02821601..._UnitLogs.tgz
C02811700..._UnitLogs.tgz
C02819300..._UnitLogs.tgz
前 7 天
C02821600...INIT_UnitLogs
Atlaslogs
DCSD_DFU.log
DFU_sequence.json
failedItems.csv
FFDCSDRest...PCClient.log
pdca.csv
restore_device_DFU.log
restore_host_DFU.log
testTimes.csv
unit.log
2017-12-02_10-59-24
********** RestoreiOS (RestoreXPCService 1) **********
[10:59:40.5638] SYSLOG: Jan 1 00:00:20 localhost bootlog[0] <Notice>: BOOT_TIME 20 89843
[10:59:40.5638] [00:00:20.0647-GMT]{4>9} CHECKPOINT NOTICE: Image4 device: AP nonce clearable
[10:59:40.5638] entering ramrod_clear_ap_nonce
[10:59:40.5638] [00:00:20.0840-GMT]{4>9} CHECKPOINT NOTICE: AP nonce consumed
[10:59:40.5638] [00:00:20.0840-GMT]{4>9} CHECKPOINT NOTICE: Pre-existing NVRAM variable: auto-boot=false
[10:59:40.5638] [00:00:20.0841-GMT]{4>9} CHECKPOINT NOTICE: Pre-existing NVRAM variable: restore-outcome=initial_monitor_no_return
[10:59:40.5638] [00:00:20.0844-GMT]{4>9} CHECKPOINT PROGRESS: START (unknown) -> (initial_engine_no_return)
[10:59:40.5638] [00:00:20.0844-GMT]{4>9} CHECKPOINT NOTICE: NVRAM access available on initial check
[10:59:40.5638] restore-outcome = initial_engine_no_return
restore_host_DFU.log
显示
现在
清除
重新载入
共享
搜索
[10:59:38.7508] amai: _AMAuthInstallBundleCreateServerRequestDictionary: not personalizing "DeviceTree"
[10:59:38.7509] amai: _AMAuthInstallBundleCreateServerRequestDictionary: not personalizing "iBoot"
[10:59:38.7509] amai: _AMAuthInstallBundleCreateServerRequestDictionary: nothing to be done
[10:59:38.7511] requested variant: Factory - Software Download
[10:59:38.7566] device did not return saved USB log
[10:59:38.7567] device did not return saved panic log
[10:59:38.7567] previous restore failed with exit status 0x100
[10:59:38.7575] connected to service com.apple.mobile.restored
[10:59:38.7575] using protocol version 15
[10:59:38.7619] board config = j680ap
[10:59:38.7657] value query for 'BootArgs' returned ''
[10:59:38.7669] value query for 'MarketingPartNumber' returned ''
[10:59:38.7670] requested variant: Factory - Software Download
[10:59:38.7685] Enabling system partition padding & shrinking since partition size is default
[10:59:38.7685] will create a 1275 MiB system partition
[10:59:38.7707] value query for 'HardwareModel' returned 'J680AP'
[10:59:38.7710] requested variant: Factory - Software Download
[10:59:38.7711] Established proxy for device ID 11
[10:59:39.0671] Completed checkpoint id: 0x655
[10:59:39.0766] Completed checkpoint id: 0x603
[10:59:39.0860] Completed checkpoint id: 0x604
[10:59:39.0923] Completed checkpoint id: 0x605
[10:59:39.1021] Completed checkpoint id: 0x606
[10:59:39.1124] <Restore Device 0x7fdfcfd305f0>: operation 30 progress -1
[10:59:39.3173] Completed checkpoint id: 0x607
[10:59:39.3222] <Restore Device 0x7fdfcfd305f0>: operation 35 progress -1
[10:59:39.3222] requested variant: Factory - Software Download
host log停在 operation 35
restore_device_DFU.log
显示
现在
清除
重新载入
共享
搜索
[11:18:48.2901] seputil failure when attempting to commit the SEP manifest/hash: 5 - sleeping for 1s before trying again
[11:18:49.2929] executing /usr/libexec/seputil --commit-hash
[11:18:59.3917] seputil: commit hash returned 0xe00002d6
[11:18:59.3917] seputil: failed to commit hash
[11:18:59.3918] seputil failure when attempting to commit the SEP manifest/hash: 5 - sleeping for 1s before trying again
[11:19:00.3974] executing /usr/libexec/seputil --commit-hash
[11:19:10.4958] seputil: commit hash returned 0xe00002d6
[11:19:10.4958] seputil: failed to commit hash
[11:19:10.4962] seputil failure when attempting to commit the SEP manifest/hash: 5 - sleeping for 1s before trying again
[11:19:11.4991] executing /usr/libexec/seputil --commit-hash
[11:19:21.6005] seputil: commit hash returned 0xe00002d6
[11:19:21.6005] seputil: failed to commit hash
[11:19:21.6006] seputil failure when attempting to commit the SEP manifest/hash: 5 - sleeping for 1s before trying again
[11:19:22.6062] executing /usr/libexec/seputil --commit-hash
[11:19:32.7030] seputil: commit hash returned 0xe00002d6
[11:19:32.7030] seputil: failed to commit hash
[11:19:32.7034] seputil failure when attempting to commit the SEP manifest/hash: 5 - sleeping for 1s before trying again
[11:19:33.7087] executing /usr/libexec/seputil --commit-hash
[11:19:43.8058] seputil: commit hash returned 0xe00002d6
[11:19:43.8058] seputil: failed to commit hash
[11:19:43.8059] seputil failure when attempting to commit the SEP manifest/hash: 5 - sleeping for 1s before trying again
[11:19:44.8103] executing /usr/libexec/seputil --commit-hash
[11:19:51.2305] recv(25, 4) failed: connection closed
[11:19:51.2307] unable to read message size: -1
[11:19:51.2310] could not receive message
device log停在SEP



TDM fail:DFU NAND Init/TDM Restore Look For TDM Keyword

TDM:目标磁盘模式，DFU station在TDM模式下restore SSD

TDM fail常见原因：no power, hang, auto shutdown, EG hang, 主要通过PCH及SMC log判断

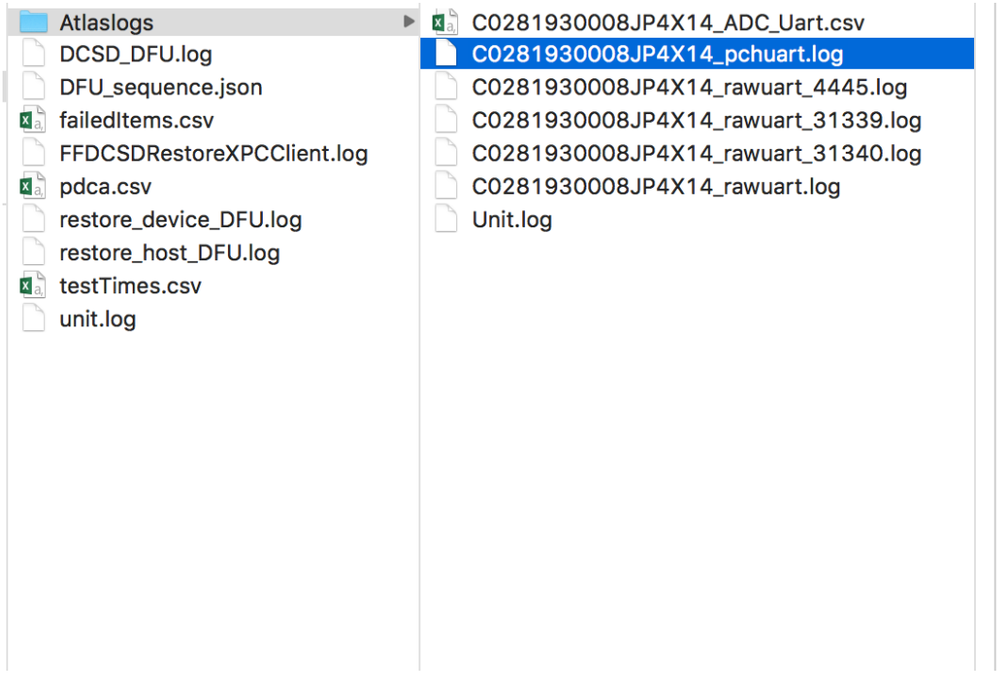
<rdar://problem/40125522> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/TDM Restore Wait for TDM Keyword [T+], DES2 (C0281930008JP4X14)[Material] [CPU warpage caused solder Open]
<rdar://problem/40157119> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/TDM Restore Wait for TDM Keyword [T+], DES4 (C028194000GJP8M1T)[Material] [CPU warpage caused solder Open]
<rdar://problem/40189764> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/TDM Restore Wait for TDM Keyword [T+], DES6 (C028196000HJP8417) [Process] [PCH slight tilt to lead solder open]
<rdar://problem/39888504> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/TDM Restore Wait for TDM Keyword [T+], EMC2 (C028182000PJP8M1R)[Material] [CPU warpage caused solder Open]
<rdar://problem/40115700> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/TDM Restore Wait for TDM Keyword [T+], Main17 (C028187001DJP501P) [Material] [CPU warpage caused solder Open][PLT_RST_L keep low]
<rdar://problem/40281544> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/TDM Restore Wait for TDM Keyword [T+], NA (C028185002JJP8M1M)[Material] [CPU warpage caused solder Open]

例:C0281930008JP4X14

Product Task	Stage		Result	Test Symptom	Rework Symptom	Rework Action Taken	Comments	Special Build	Times Through	# of Fails	Station	Line	Fixture ID / Testhead ID	Shift	Site	Operator Name	Timestamp	Download Plog
DFU-NAND-INIT	Test		FAIL	DFU NAND INIT/TDM RESTORE WAIT FOR TDM KEYWORD [T+]/RESULT	-	-	-	J680-DVT_DES2_MSMT-J680-J680 CPU	1	13	QSMC_F05-3FT-M35_18_DFU-NAND-INIT	F05-3FT-M35	2 / 2	PM	QSMC		2018-05-10 15:31:27	
DFU-NAND-INIT	Test		FAIL	DFU NAND INIT/TDM RESTORE WAIT FOR TDM KEYWORD [T+]/RESULT	-	-	-	J680-DVT_DES2_MSMT-J680-J680 CPU	1	13	QSMC_F05-3FT-M35_23_DFU-NAND-INIT	F05-3FT-M35	1 / 1	PM	QSMC		2018-05-10 14:11:34	
DFU-NAND-INIT	Test		FAIL	DFU NAND INIT/TDM RESTORE WAIT FOR TDM KEYWORD [T+]/RESULT	-	-	-	J680-DVT_DES2_MSMT-J680-J680 CPU	0	13	QSMC_F05-3FT-M35_23_DFU-NAND-INIT	F05-3FT-M35	1 / 1	PM	QSMC		2018-05-10 13:20:29	

例:C0281930008JP4X14

如右图，它的pchuart log是空的，但是31339 SMC log可以对比出异常



C0281170008JPD71M_rawuart_31339.log

显示 现在 清除 重新载入 共享 搜索

```
03/23/2018 00:25:40.345 System Wake Reason: 0x00
03/23/2018 00:25:40.345 PWRBTN Output Released
03/23/2018 00:25:40.345 SSM: S5_Off -> S4_Power_On
03/23/2018 00:25:40.345 SSM: PSOC_RDY_FOR_S0 = 1
03/23/2018 00:25:40.345 SSM: S4_Power_On -> S3_Power_On
03/23/2018 00:25:40.345 PVDDQ POK
03/23/2018 00:25:40.345 SSM: S3_Power_On -> S0_Power_On
03/23/2018 00:25:40.345 VCCPLLOC POK
03/23/2018 00:25:40.345 VCCIO POK
03/23/2018 00:25:40.345 CPUVR POK
03/23/2018 00:25:40.345 PCH_PWROK asserted
03/23/2018 00:25:40.467 AGCI: I2C init complete
03/23/2018 00:25:40.467 AGCI: GFXB is On
03/23/2018 00:25:40.467 SYS_PWROK asserted
03/23/2018 00:25:40.467 System Power State: S5 Off -> S0 Run
03/23/2018 00:25:40.467 System State: In Run
03/23/2018 00:25:40.467 SSM: S0_Power_On -> S0
03/23/2018 00:25:40.467 PWRBTN Output Released
03/23/2018 00:25:40.467 Auto power button press done, in S0
03/23/2018 00:25:40.467 SSM: PLTRST# = 1
03/23/2018 00:25:40.549 SSM: PSOC_PCIE_RDY = 1
03/23/2018 00:25:40.625 vSMC1msTask: time=30527918 cnt=29000
03/23/2018 00:25:41.347 vSMC1msTask: time=31527918 cnt=30000
03/23/2018 00:25:42.347 vSMC1msTask: time=32527967 cnt=31000
03/23/2018 00:25:43.389 vSMC1msTask: time=33527968 cnt=32000
03/23/2018 00:25:44.304 vSMC1msTask: time=34527967 cnt=33000
03/23/2018 00:25:45.364 vSMC1msTask: time=35527966 cnt=34000
03/23/2018 00:25:46.392 vSMC1msTask: time=36527966 cnt=35000
03/23/2018 00:25:47.349 vSMC1msTask: time=37527964 cnt=36000
03/23/2018 00:25:48.311 vSMC1msTask: time=38527972 cnt=37000
03/23/2018 00:25:49.307 vSMC1msTask: time=39527966 cnt=38000
03/23/2018 00:25:50.324 vSMC1msTask: time=40527964 cnt=39000
```

Good SMC log

C0281930008JP4X14_rawuart_31339.log

显示 现在 清除 重新载入 共享 搜索

```
05/10/2018 15:34:18.163 VCCPLLOC POK
05/10/2018 15:34:18.163 VCCIO POK
05/10/2018 15:34:18.163 CPUVR POK
05/10/2018 15:34:18.163 PCH_PWROK asserted
05/10/2018 15:34:18.163 AGCI: I2C init complete
05/10/2018 15:34:18.163 AGCI: GFXB is On
05/10/2018 15:34:18.271 SYS_PWROK asserted
05/10/2018 15:34:18.271 System Power State: S5 Off -> S0 Run
05/10/2018 15:34:18.271 System State: In Run
05/10/2018 15:34:18.271 SSM: S0_Power_On -> S0
05/10/2018 15:34:18.271 SSM: PLTRST# = 1
05/10/2018 15:34:18.271 PWRBTN Output Released
05/10/2018 15:34:18.271 Auto power button press done, in S0
05/10/2018 15:34:18.271 SSM: PSOC_PCIE_RDY = 1
05/10/2018 15:34:18.271 vSMC1msTask: time=85155524 cnt=73000
05/10/2018 15:34:18.996 vSMC1msTask: time=86155471 cnt=74000
05/10/2018 15:34:19.997 vSMC1msTask: time=87155464 cnt=75000
05/10/2018 15:34:21.002 vSMC1msTask: time=88155453 cnt=76000
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a5 Dt=00, St=0a
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a5 Dt=00, St=0a
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a5 Dt=00, St=0a
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 PECI Err: A=30 Cmd=a1 Dt=81, St=08
05/10/2018 15:34:22.010 vSMC1msTask: time=89155446 cnt=77000
05/10/2018 15:34:22.969 PECI Err: A=30 Cmd=a5 Dt=00, St=0a
```

NG SMC log

CPU solder issue

DFU其它single fail

1、Thunderbolt fail

<rdar://problem/34536447> J680 Proto1 DFU-NAND-INIT: DFU NAND Init/PCIe 2395 Thunderbolt[1] Device Detection Test, Main5 (C027374002NJGLH1X) [Duplicate][Dup to 34472853]
<rdar://problem/34618803> J680 Proto1 DFU-NAND-INIT: DFU NAND Init/PCIe 2395 Thunderbolt[1] Device Detection Test, OFJ1 (C027382000CJH1T1Q) [Duplicate][Dup to 34472853]
<rdar://problem/38858076> J680 EVT M25 DFU-NAND-INIT: DFU NAND Init/PCIe 8016 Thunderbolt[0] PCIe Link Width Test, AMD7 (C0281150004JP5X1T) [SAF to AEE]
<rdar://problem/38786255> J680 EVT M25 DFU-NAND-INIT: DFU NAND Init/PCIe 8016 Thunderbolt[0] PCIe Link Width Test, Main2 (C028122001DJP8M1G) [SAF to AEE]
<rdar://problem/40479641> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/PCIe 8008 Thunderbolt[1] PCIe Link Speed Test, SRB2 (C028206001NJP881M)

Thunderbolt0—>U2800

Thunderbolt1—>Ub000

C0281150004JP5X1T:

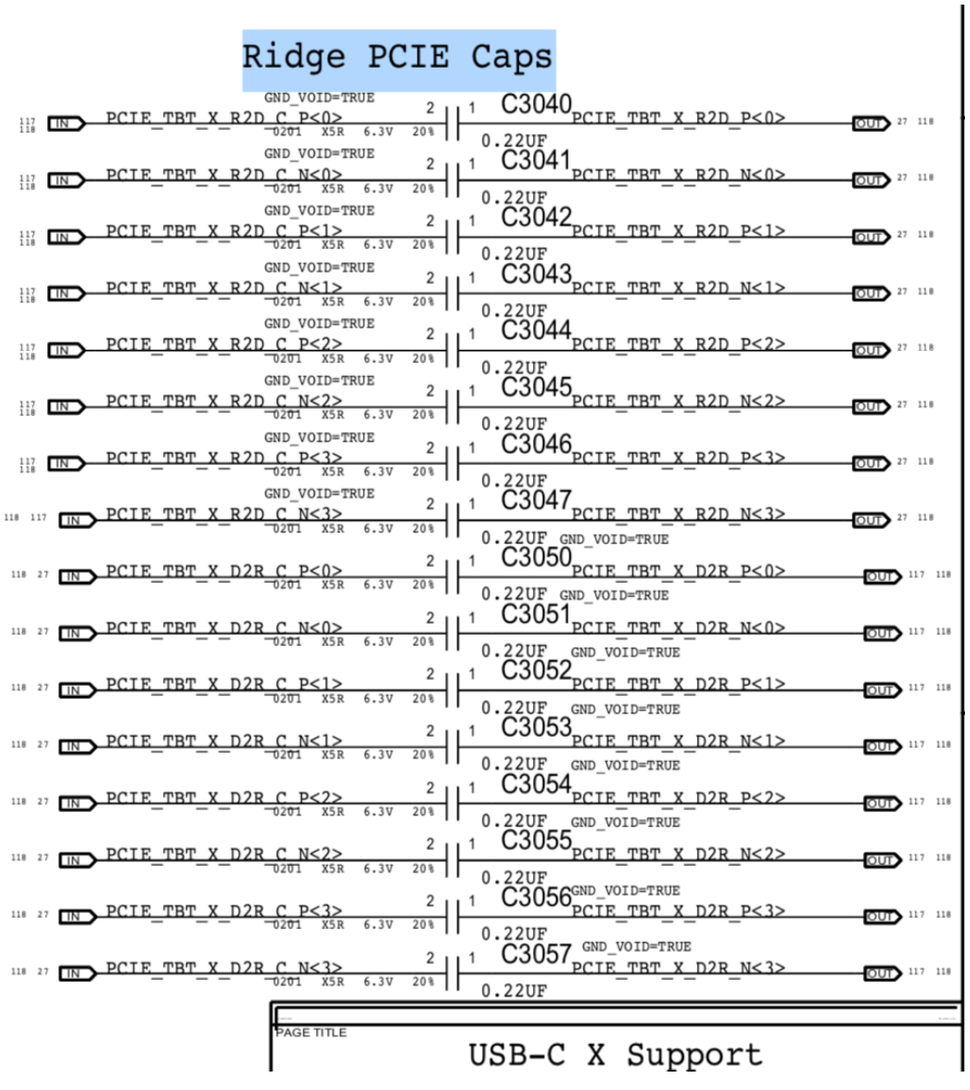
DFU-NAND-INIT	Test		FAIL	DFU NAND INIT/PCIE 8016 THUNDERBOLT[0] PCIE LINK WIDTH TEST/RESULT
DFU-NAND-INIT	Test		FAIL	DFU NAND INIT/PCIE 8016 THUNDERBOLT[0] PCIE LINK WIDTH TEST/RESULT
DFU-NAND-INIT	Test		FAIL	DFU NAND INIT/PCIE 8016 THUNDERBOLT[0] PCIE LINK WIDTH TEST/RESULT

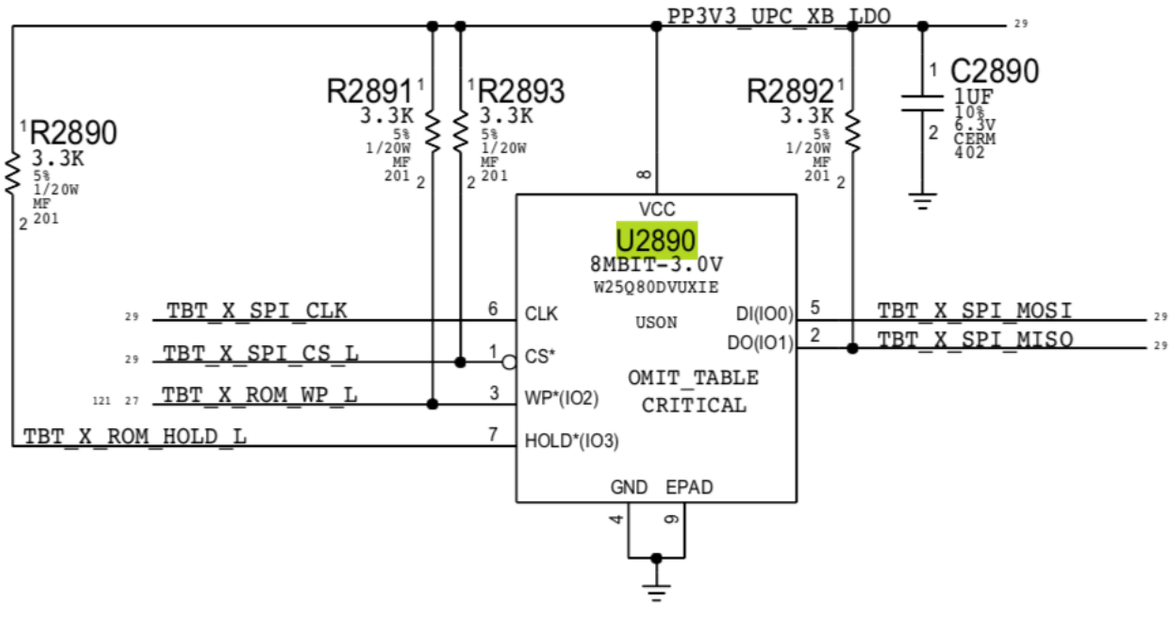
Atlaslogs
DCSD_DFU.log
DFU_sequence.json
failedItems.csv
FFDCSDRest...PCClient.log
pdca.csv
restore_device_DFU.log
restore_host_DFU.log
testTimes.csv
unit.log
Mar 26 10:29:54 atlascore[42600] slot[1] FAILING >> FAILED
Mar 26 10:51:01 atlascore[42600] Atlas Version: 1.5.7e9
Mar 26 10:51:01 atlascore[42600] slot[1] FAILED >> UNPAIRED
Mar 26 10:51:01 atlascore[42600] Unpaired to slot #Optional(atlascore.Slot)
Mar 26 10:52:14 atlascore[42600] Atlas Version: 1.5.7e9
Mar 26 10:52:14 atlascore[42600] Paired to slot #3
Mar 26 10:52:14 atlascore[42600] unit FAILED >> PAIRED
Mar 26 10:52:15 atlascore[42600] slot[3] PAIRED >> STARTING
Mar 26 10:52:15 atlascore[42600] unit PAIRED >> STARTING
Mar 26 10:52:15 atlascore[42600] slot[3] STARTING >> STARTED
Mar 26 10:52:15 atlascore[42600] unit STARTING >> STARTED
Mar 26 10:52:15 atlascore[42600] +==============================+
Mar 26 10:52:15 atlascore[42600] Queued sequence: DFU/SWDL (v. TP0.0-R84)
Mar 26 10:52:15 atlascore[42600] +------------------------------+
Mar 26 10:52:15 atlascore[42600] action[425]: {
Mar 26 10:52:15 atlascore[42600] "state" : "PENDING",
在unit.log 中搜索fail code
unit.log
显示
现在
清除
重新载入
共享
搜索
PCIe 8016 Thunderbolt[0] PCIe Link Width Test
完成
[25;10H[1m[33m[40mk[25;11H[25;11H[1m[33m[40mW[25;12H[25;12H[1m[33m[40mi[25;13H[25;13H[1m[33m[40md[25;14H[25;14H[1m[33m[40mt[25;15H[25;15H[1m[33m[40mh[25;16H[25;16H[1m[33m[40m'[25;17H[25;17H[1m[33m[40m:
[25;18H[25;18H[1m[33m[40m4[25;19H[25;19H[1m[33m[40m}[25;20H[25;20H[1m[33m[40m[0m[37m[40m[0m[37m[40m
[0m[37m[40m[0m[37m[40m[0m[37m[40m!0x00000078
[0m[37m[40mCLICommand=<null string>
[0m[37m[40mLoading environment file: env.json ...
[0m[37m[40m[0m[37m[40m[0m[37m[40m

2、ACE Connectivity fail

<rdar://problem/37057885> J680 PreEVT DFU-NAND-INIT: DFU NAND Init/ACE Connectivity ACE Version, Main1B (C028045000JJP4H1N) [Process][U0500 solder bridge]
<rdar://problem/36976055> J680 PreEVT DFU-NAND-INIT: DFU NAND Init/ACE Connectivity ACE Version, Main1B (C028045002MJP4H1D)[Process][U0500 solder bridge]
<rdar://problem/38646653> J680 EVT M25 DFU-NAND-INIT: DFU NAND Init/ACE Connectivity ACE Version, Main1 (C0281170010JP4D1D)[Process][CB246 Tomb]
<rdar://problem/35686491> J680 Proto2 DFU-NAND-INIT: DFU NAND Init/ACE Connectivity ACE Version, Main14 (C027467005CJLTJ15) [SW][TBT1 ROM Crashed during update]

ACE Connectivity 往往是TBT missing，首先检查TBT PCIE 电容，TBT ROM，
再对TBT和CPU照X-RAY





3:DFU audio reset fail

<rdar://problem/36978224> J680 PreEVT DFU-NAND-INIT: DFU NAND Init/Audio Left SPK Vendor, Main2 (C028043000DJP9Y1Z)[Process][Wrong Material]
<rdar://problem/36978152> J680 PreEVT DFU-NAND-INIT: DFU NAND Init/Audio Right SPK vendor, Main2 (C028043002LJP9Y1L)[Process][Wrong Material]
<rdar://problem/36976109> J680 PreEVT DFU-NAND-INIT: DFU NAND Init/Audio audio reset, Main1 (C0280430006JP4H12)[Process][U6300 Soldering bridge]
<rdar://problem/36970618> J680 PreEVT DFU-NAND-INIT: DFU NAND Init/Audio audio reset, Main1 (C0280430008JP4H10)[Process][U6300 Soldering bridge]
<rdar://problem/38816915> J680 EVT M25 DFU-NAND-INIT: DFU NAND Init/Audio audio reset, Main13 (C028107000MJP891Q)[Process][C6564 C6563 C6559 damage]
<rdar://problem/38743374> J680 EVT M25 DFU-NAND-INIT: DFU NAND Init/Audio audio reset, Main5 (C028117001DJP7D1R)[Process][C6458 Wrong component]
<rdar://problem/39899721> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/Audio audio reset, DES12 (C028181002WJPDF14) [Process][U6300 cracked]
<rdar://problem/40052071> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/Audio audio reset, Main10 (C0281850008JP841L) [materia][U6500]

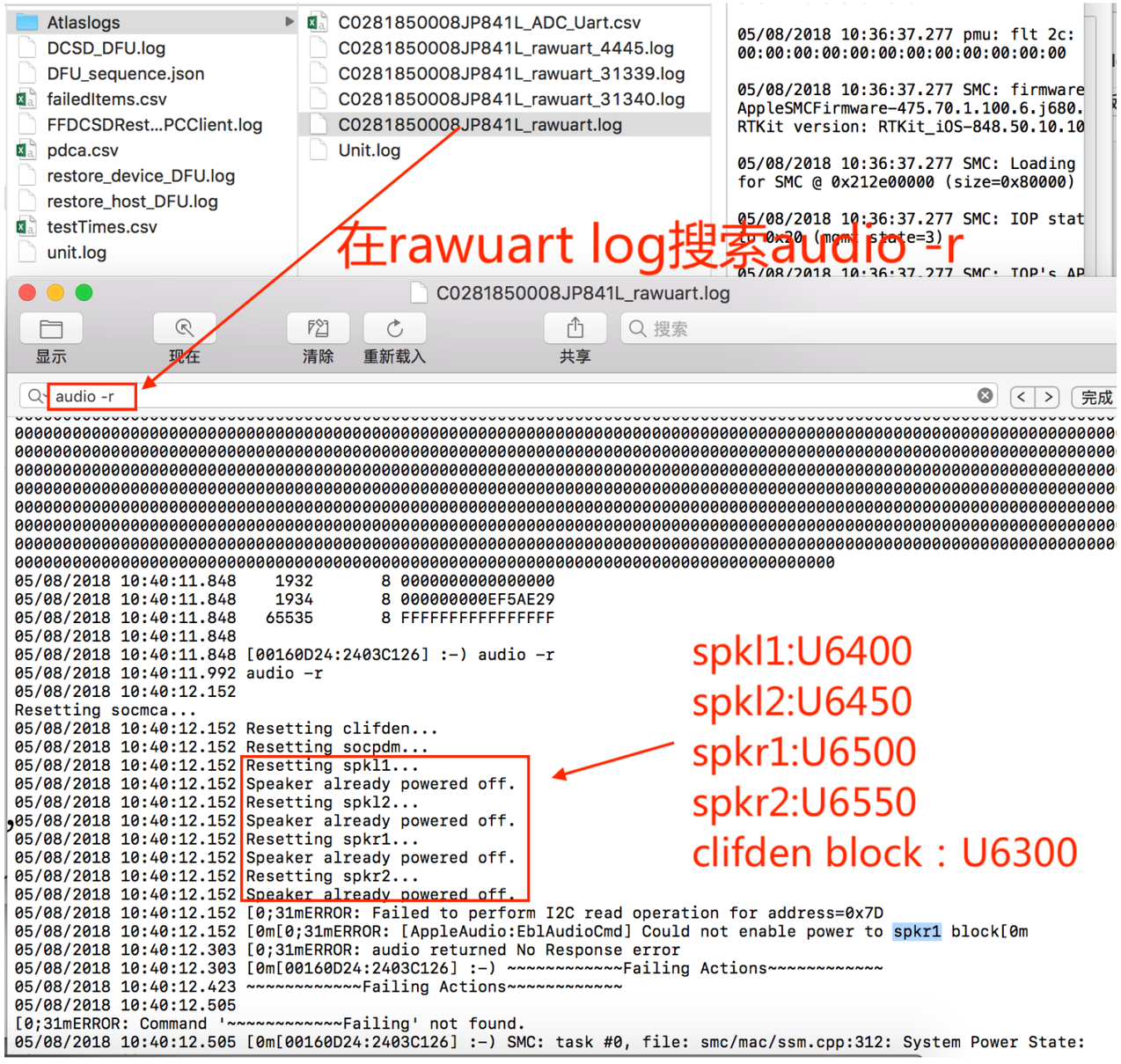
例:<rdar://problem/40052071> J680 DVT M35 DFU-NAND-INIT: DFU NAND Init/Audio audio reset, Main10 (C0281850008JP841L) [materia][U6500]

首先在rawuart.log里面搜索“audio -r”

spkl1:U6400
spkl2:U6450
spkr1:U6500
spkr2:U6550

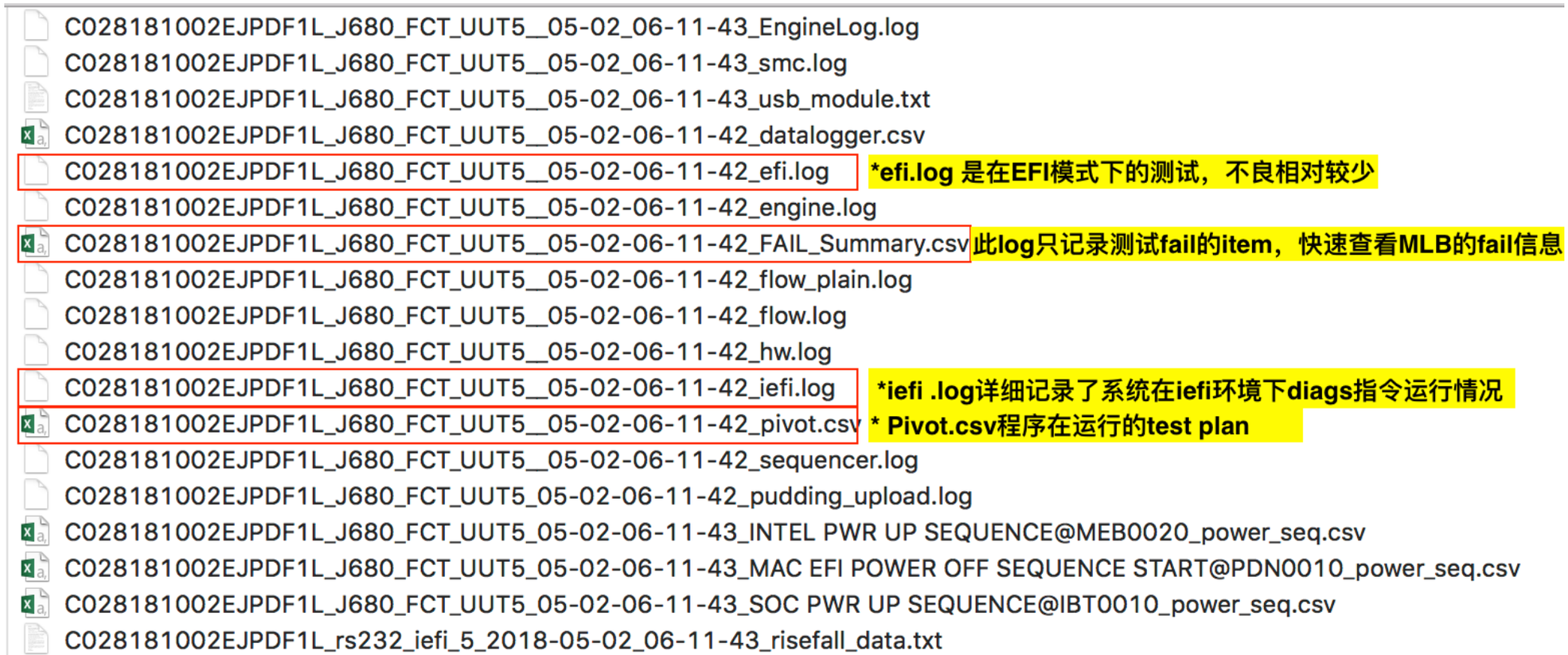
log报“Could not enable power to clifden block”， 则怀疑U6300问题

如若，换U6300不能解决问题，则需要给MLB restore bundle进入macOS检查specker，Audio jack，耳机的功能。



四、如何看FCT log

FCT fail log 主要看的是iefi.log. iefi.log的最后就是fail的信息。



2.USBC failure.

当拿到USB的不良，basically common的检查方式为，找到对应的问题后再来做维修

ACE & TBT Debug SOP 5/7/2018
Before you go deeper

(1) Confirm if B281 charging works (validate PD)
- TOP orientation
  - does it charge, do you see 20V on VBUS
- BOT orientation
  - does it charge, do you see 20V on VBUS

(2) Confirm if USB2 stick works with A120 (validate D pairs)
- TOP orientation
  - do you see 5V on VBUS
  - do you see the USB device?
- BOT orientation
  - do you see 5V on VBUS
  - do you see the USB device?

(3) Confirm if USB2 stick works with A118 (validate VCONN)
- TOP orientation
  - do you see 5V on VBUS
  - do you see 5V on CC2
  - do you see the USB device?
- BOT orientation
  - do you see 5V on VBUS
  - do you see 5V on CC1
  - do you see the USB device?

(4) Redo (2) with USB3 stick (validate the TR)

(5) Redo (3) with USB3 stick (validate the TR) - Optional

同时，列举相应不良案例：

2.1 USB3.0 failure.

USB3.0的线路相对简单直接通过接口（JB500->T port. J3300->X port.)的高速信号与Titan ridge（U2800&UB000）通信。检查USB功能，如果只是USB3.0没功能，因为在FCT的测试时序先测USB2.0再测USB3.0，所以CC 的线路应该是没有问题的。 所以只需要量测高速信号的对地阻抗和线路的元器件。（USBC_TB_R2D_CR_N&USBC_TB_R2D_CR_P&USBC_TB_D2R_N&USBC_TB_D2R_P ）

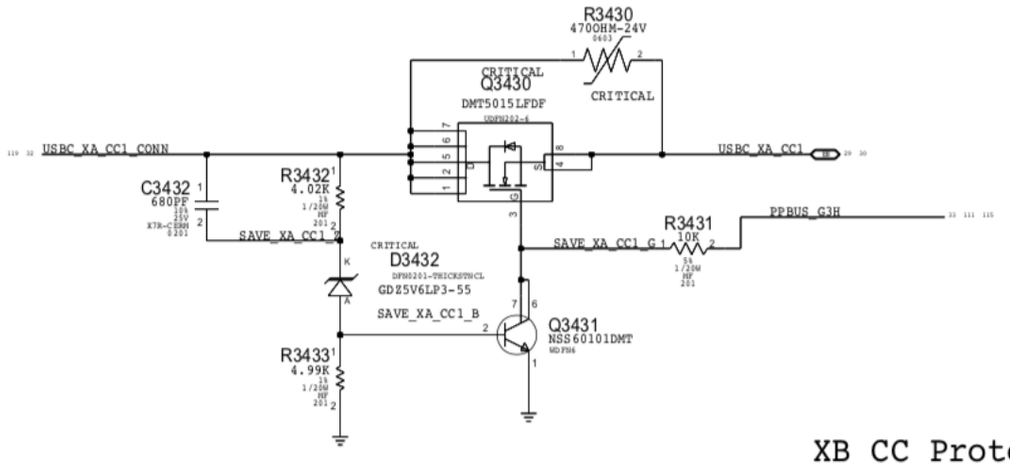
<rdar://problem/38850823> J680 EVT M25 B_FCT: USBC 3.0 PRESENT TEST/CHECK TA_3.0_BOT PRESENT@UPT0600, KB3 (C028125000YJP5G1B)[Process][CB583 and CB582 shift to together]
<rdar://problem/38778604> J680 EVT M25 B_FCT: USBC 3.0 PRESENT TEST/CHECK TA_3.0_BOT PRESENT@UPT0600, Main7 (C028122001JJP4P1M)[Process][CB582 and CB583 shift to together]
<rdar://problem/38778643> J680 EVT M25 B_FCT: USBC 3.0 PRESENT TEST/CHECK XB_3.0_BOT PRESENT@UPT0590, Main7 (C028122001SJP4P1D)[Process][C3386 and C3387 shift to together]

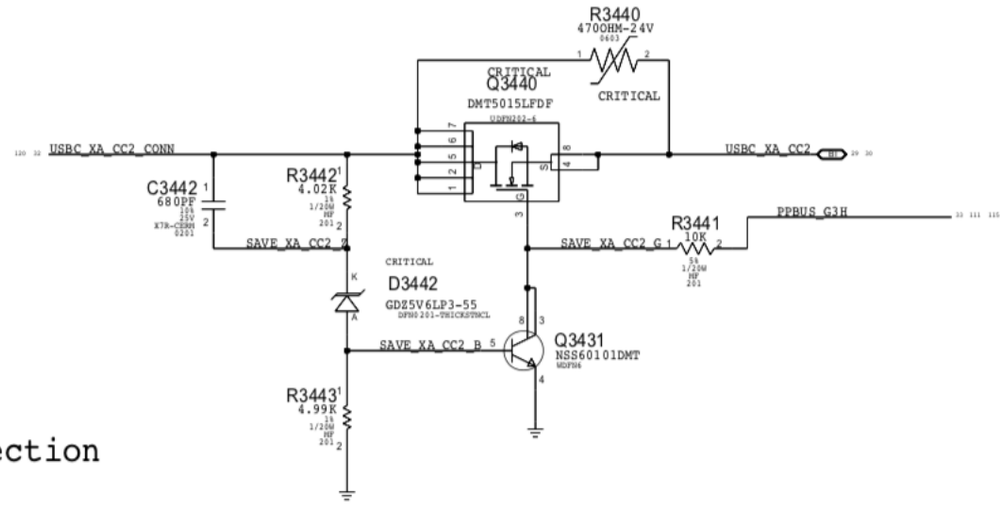
2.2 一边的USB3.0&USB2.0都没功能

在拿到不良板确认USB的功能，如果同一边两个口的USB2.0&USB3.0都没有功能，第一步应确认USB PP5V_S4的电是否正常(X port ->PP5V_S4_X_USBC T port ->PP5V_S4_T_USBC). 如果5V的电正常， 第二步检测两侧CC pin的阻抗以及电压。如果CC不正常，则先检查CC Protection 线路上的元器件，然后再换ACE。

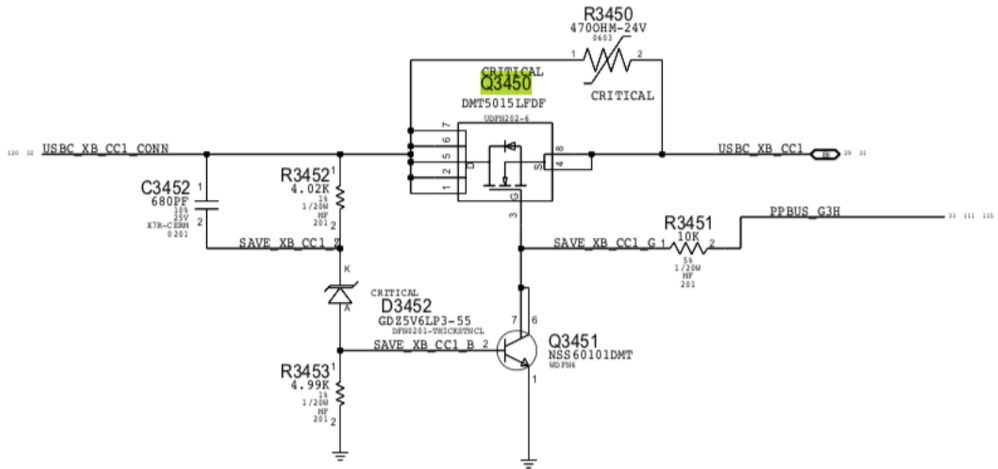
<rdar://problem/40324699> J680 DVT M35 B_FCT: TA&TB port USB2.0&USB3.0 no function., Main26A (C0282020009JP8H1Y)[Material][CB709 short][Rohm 150uF cap]
<rdar://problem/38661517> J680 EVT M25 B_FCT: IEFI XB USB2.0&USB3.0 no function Main18 (C028112003UJP8D16) [Material][Q3450]
<rdar://problem/35785995> J680 Proto2 B_FCT: MAC EFI USBC TA TB TOP ELOAD/MEASURE TB VCONN VOLTAGE @0.1A@ETT0160, Main17 (C027484000EJLTK1E) [Process][DB662 wrong polarity]
<rdar://problem/35552677> J680 Proto2 B_FCT USBC 2.0 PRESENT TEST Mini3 C027456000FJLTK1L [Process][Q3431 shift]

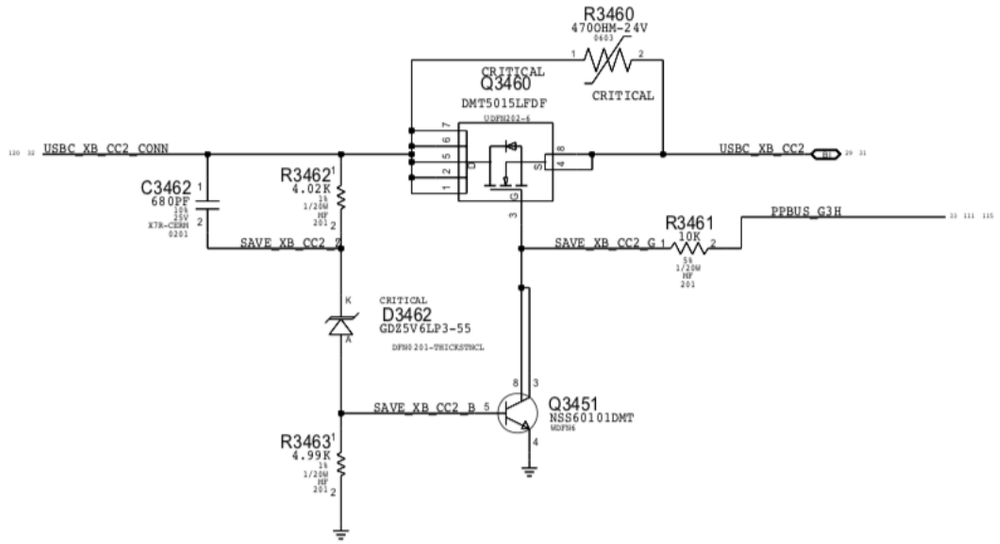
XA CC Protection





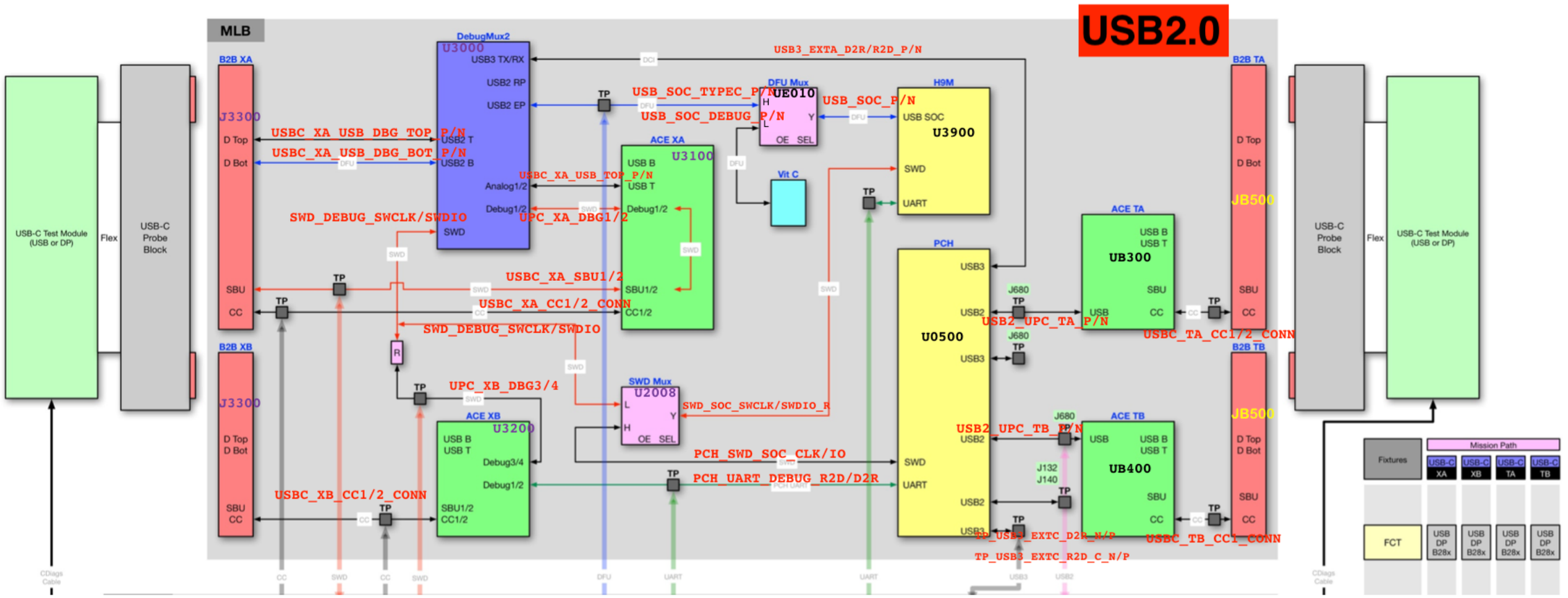
XB CC Protection





2.3 USB2.0 failure

USB2.0不良相对比较复杂，XA口和其他三个口不同，XA口的D+&D-需要经过一个debug mux U3000 再与ACE通信，而其他三个口是直接通过D+&D-与ACE通信。所以当USB2.0无功能时，应先check对应的D+&D-的对地阻抗，然后再check CC pin. 在确认D+&D-&CC线路上连接的小元器件都没问题的情况下，XA口，先换U3000，再换ACE，最后是PCH。其他三个口是先换ACE，再换PCH。当然所有换料的前提是都应该最先去把connector&ACE&PCH 照先X-ray.



<rdar://problem/35682232> J680 Proto2 B_FCT: USBC 2.0 PRESENT TEST/CHECK TA_2.0_BOT PRESENT@UPT0280, OFJ5 (C0274720005JM111M)[Process][JB500 Solder Bridge]
<rdar://problem/35821057> J680 Proto2 B_FCT: USBC 2.0 PRESENT TEST/CHECK XA_2.0_BOT PRESENT@UPT0260, DES7 (C027484000KJLNX1C)[Material][bad PCH]
<rdar://problem/37109218> J680 PreEVT B_FCT: USBC 2.0 PRESENT TEST/CHECK TA_2.0_BOT PRESENT@UPT0280, Main4 (C028045000KJP861L)[Process][JB500 less solder]
<rdar://problem/36970471> J680 PreEVT B_FCT: USBC 2.0 PRESENT TEST/CHECK XA_2.0_TOP PRESENT@UPT0100, Main5 (C0280450004JPD61L)[L3000 Rotate 90degree]
<rdar://problem/38734151> J680 EVT M25 B_FCT: USBC 2.0 PRESENT TEST/CHECK XA_2.0_TOP PRESENT@UPT0100, Main21 (C0281170036JPDF16) [Material][ACE][A118 not detect]- No VCONN on ACE XA port
<rdar://problem/40157187> J680 DVT M35 B_FCT: USBC 2.0 PRESENT TEST/CHECK TA_2.0_TOP PRESENT@UPT0120, DES1 (C028187000MJP4H14)[Process][RB717 tomb]
<rdar://problem/40281596> J680 DVT M35 B_FCT: USBC 2.0 PRESENT TEST/CHECK XA_2.0_BOT PRESENT@UPT0260, 11aRel (C028202000KJP4X1L)[Material][U3000]
<rdar://problem/35552677> J680 Proto2 B_FCT USBC 2.0 PRESENT TEST Mini3 C027456000FJLTK1L [Process][Q3431 shift]

2.4 FCT USBC ELOAD VBUS Voltage fail .

ELOAD 测试往往跟VBUS或CC相关，首先检查VBUS CC1/CC2线路上的 二极管—>MOSFET—>接口—>ACE

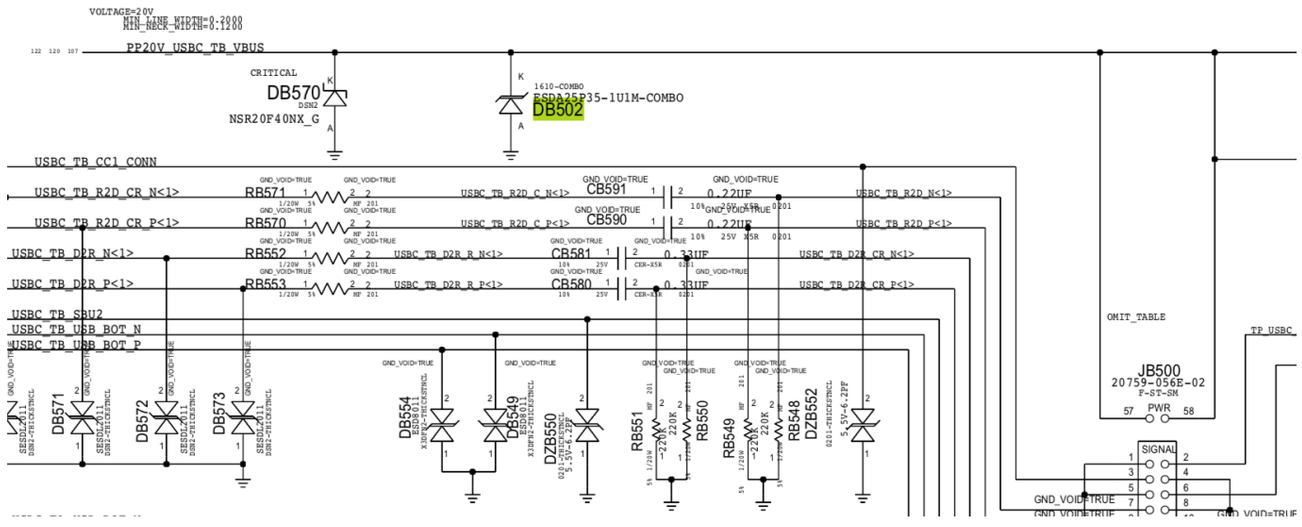
例：<rdar://problem/40054701> J680 DVT M35 B_FCT: MAC EFI USBC TA TB TOP ELOAD/MEASURE TB VBUS VOLTAGE @1A@ETT0140, Main1 (C0281840002JP4D1W)[Process][DB502 reverse]

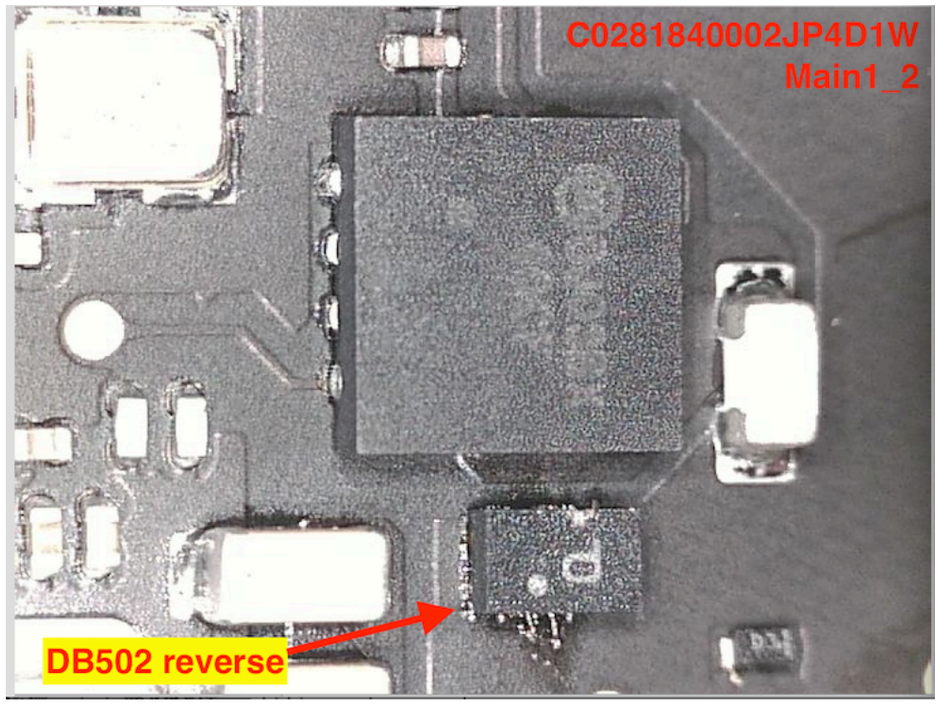
C0281840002JP4D1W_J680_FCT_UUT2__05-08-12-00-20_FAIL_Summary.csv　　使用“Microsoft Excel”打开

site	sn	group	tid	unit	low	high	month	day	hour	minute	second	microsec	result	value	fail_msg
2	skip	MAC EFI USBC TA TB TOP ELOAD	MEASURE TB VBUS VOLTAGE @1A@ETT0140	V	4.75	5.25	05	08	12	14	50	330092	Fail	18.826	

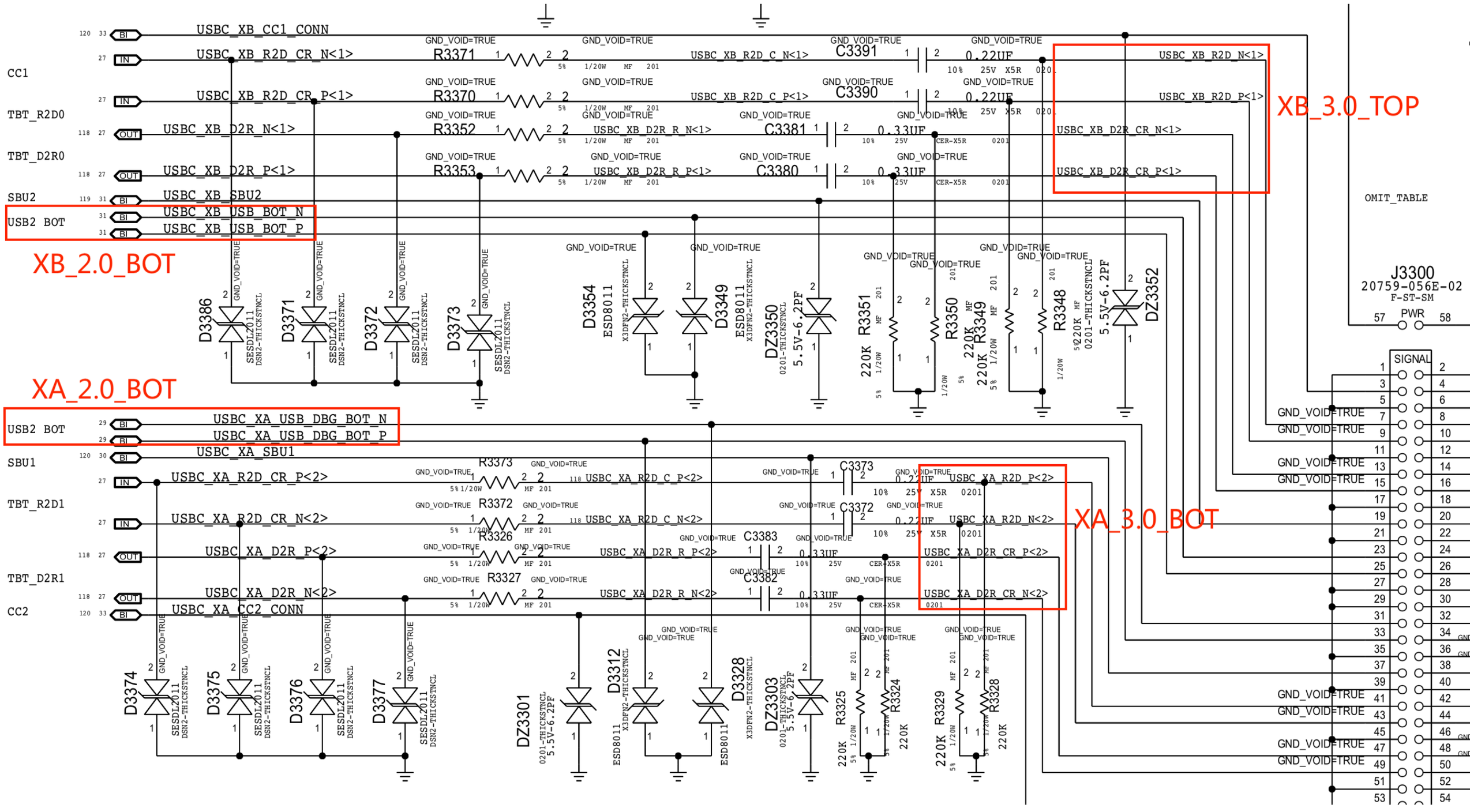
电压超出limit

DB502反向

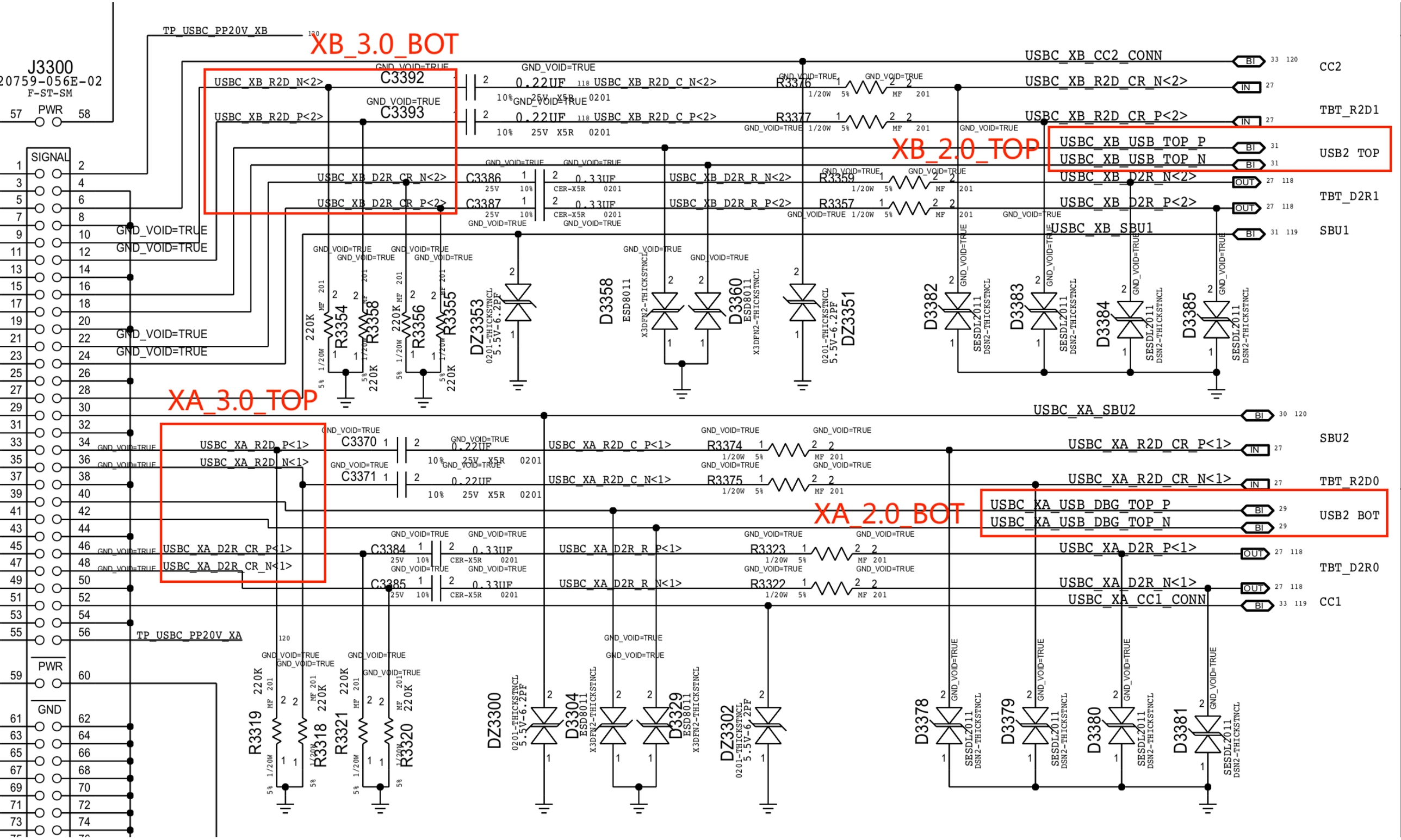




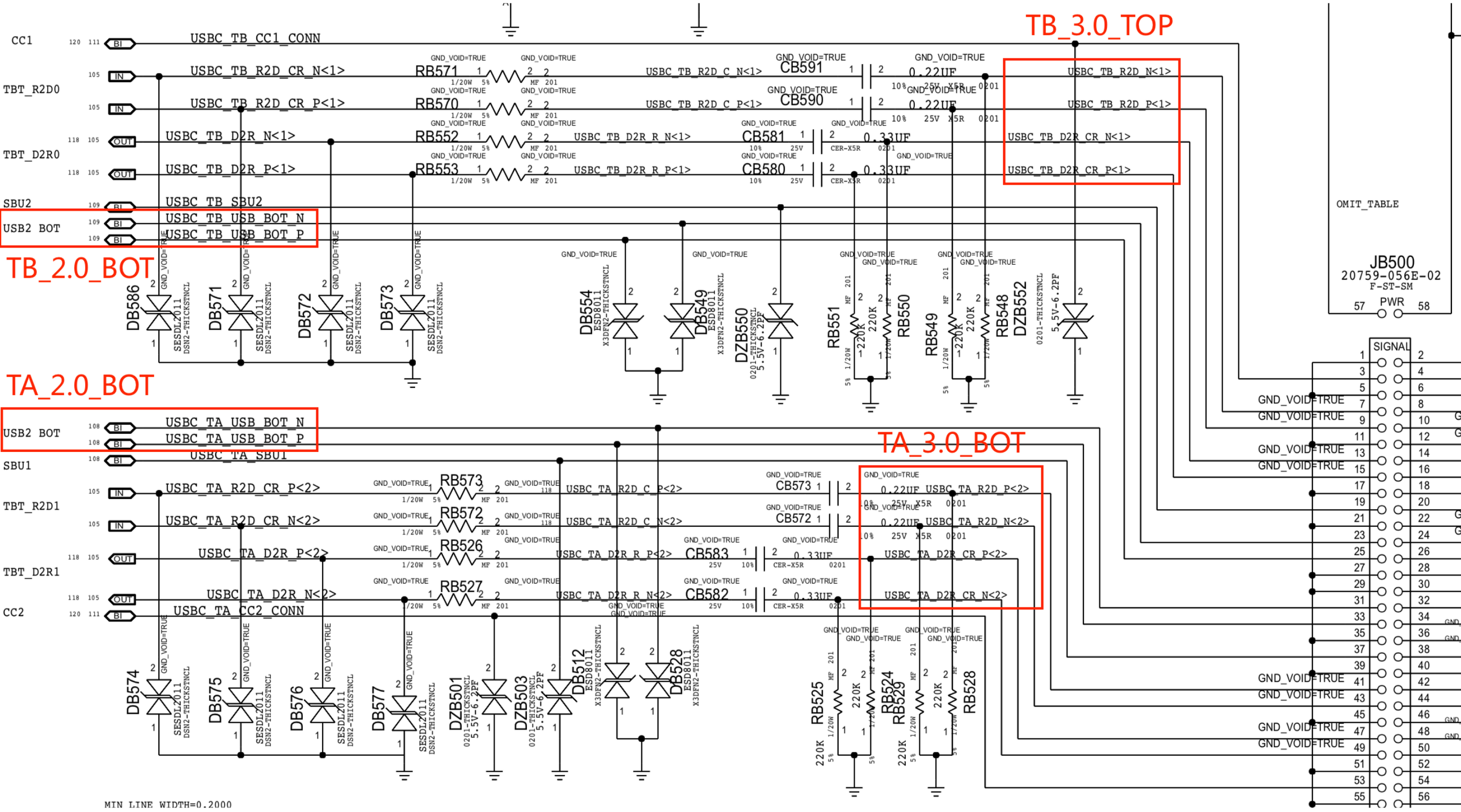
USB2.0/3.0 对应板端的相关线路：J3300



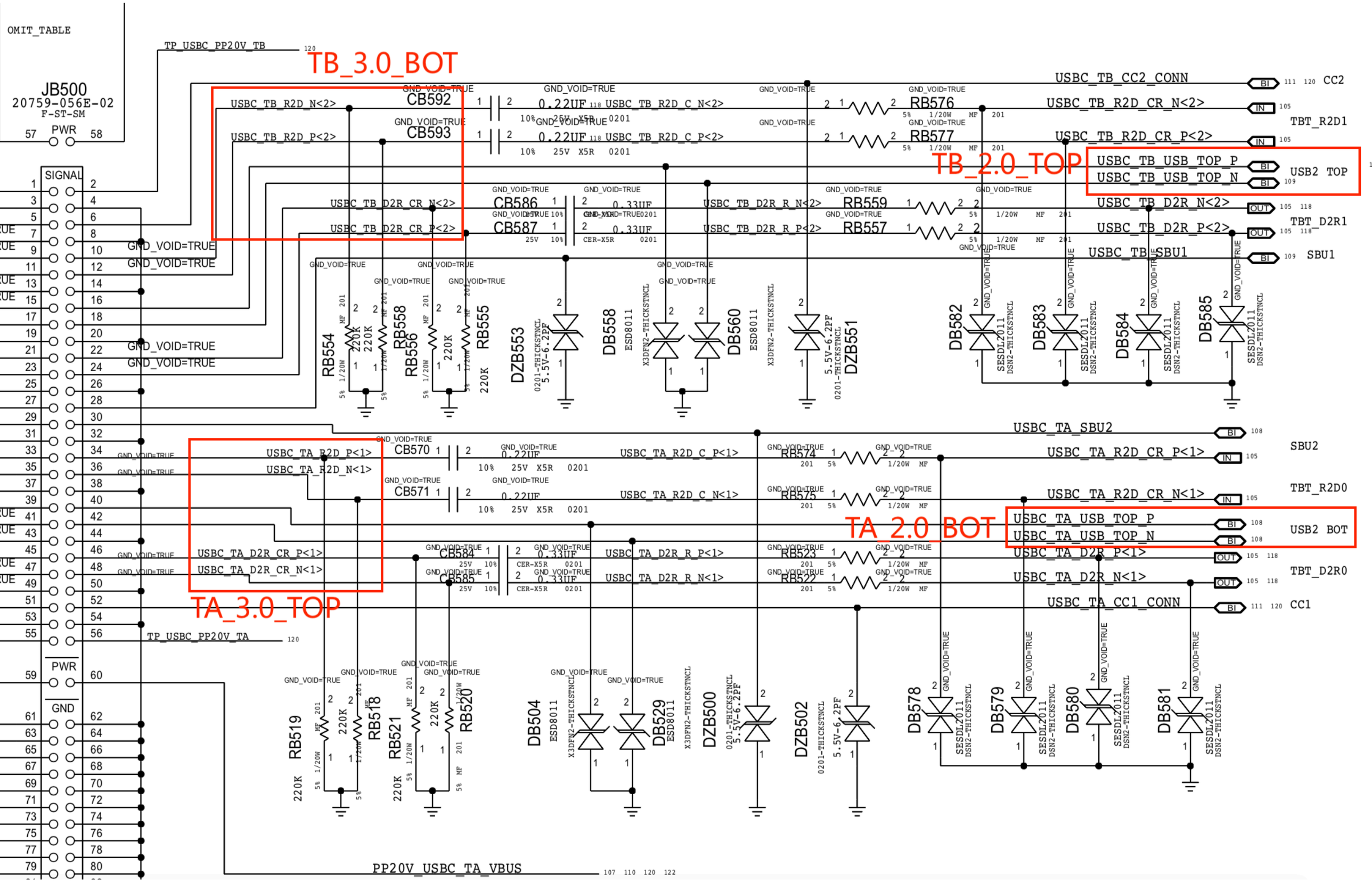
USB2.0/3.0 对应板端的相关线路：J3300



USB2.0/3.0 对应板端的相关线路：JB500



USB2.0/3.0 对应板端的相关线路：JB500



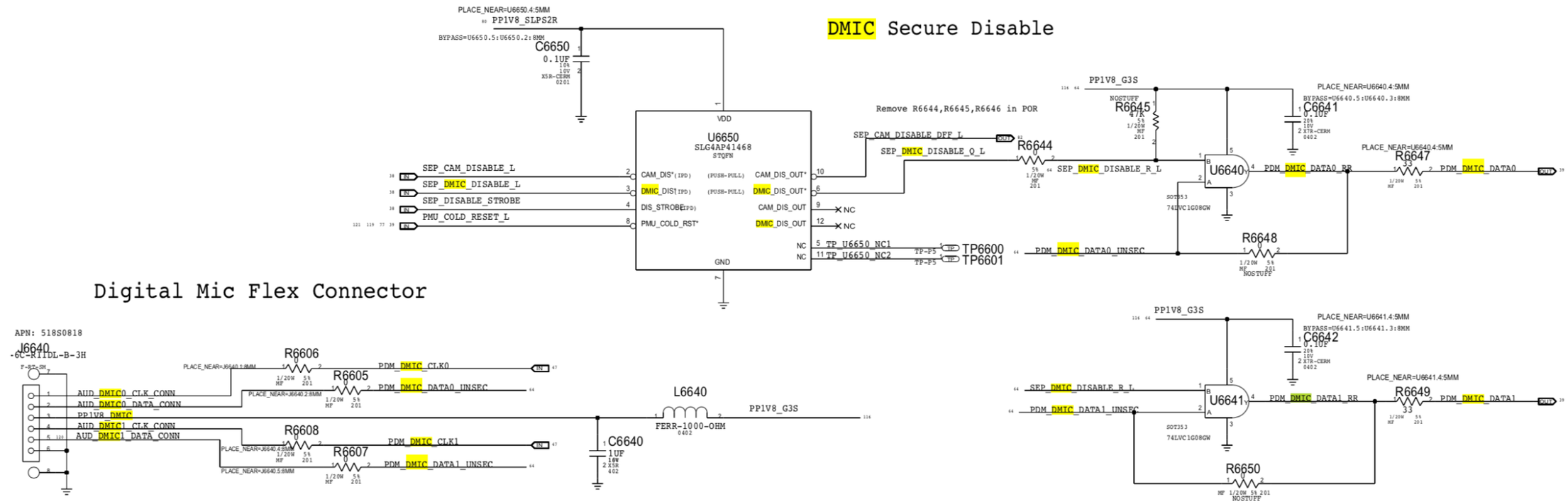
3. DMIC failure.

根据test fail item去检查相关的元器件。

IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0018 -> 检查DMIC相关的测点

IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0180 ->先检查Hall effect sensor 有没有损件，电压是否正常。 第二步检查U6650

IEFI DMIC SECURE DISABLE/DMIC 0 PDM SIGNAL POWER@SEP0330 ->检查U6650

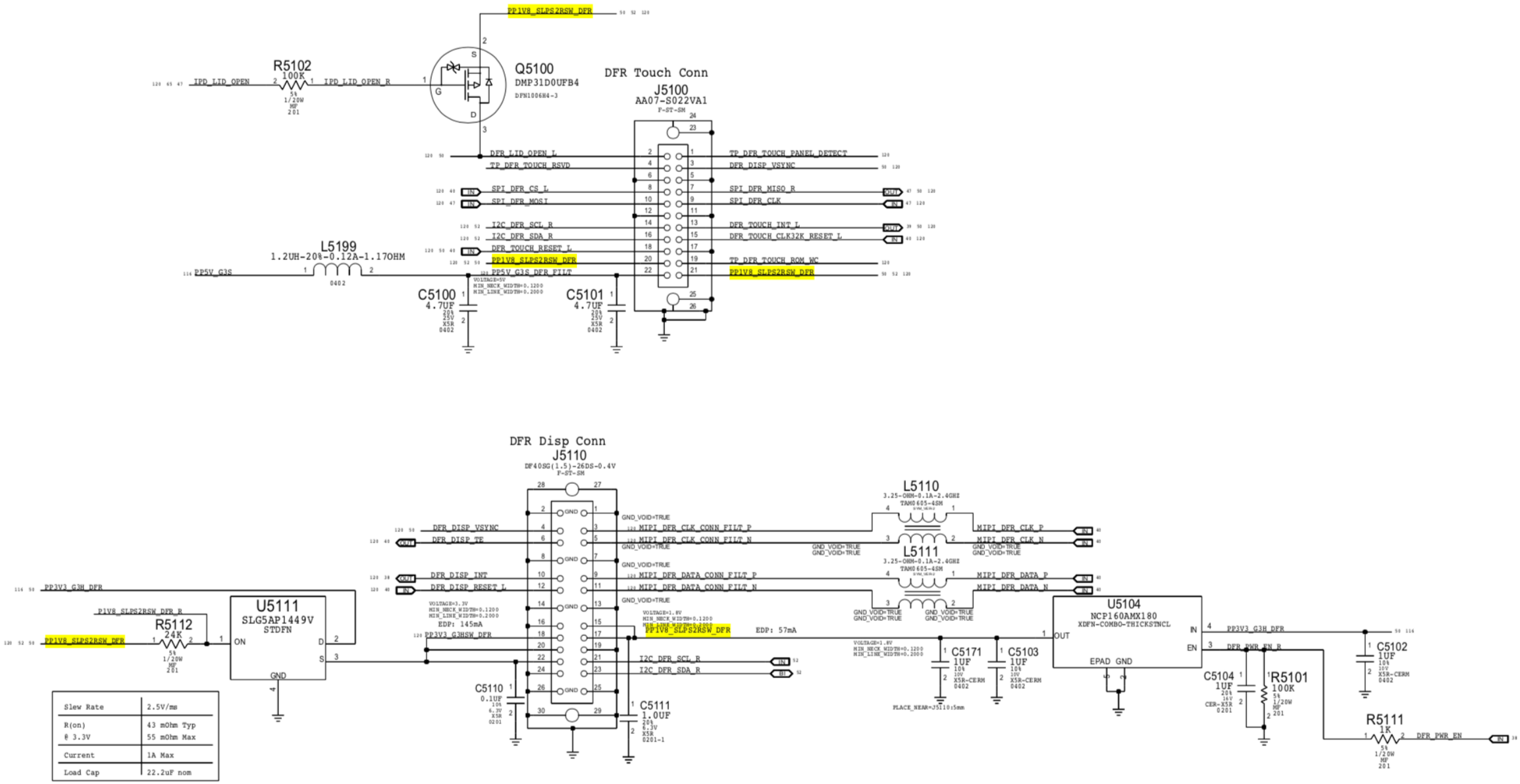


<rdar://problem/34536744> J680 Proto1 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0018, Main8-DES3 (C0273750007JGLK1F) [Process][L3500 shift][covered test point]
<rdar://problem/34563351> J680 Proto1 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0018, Main8-DES3 (C0273750008JGLK1E)[process][L3500 shift][covered test point]
<rdar://problem/38894456> J680 EVT M25 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0180, KB1 (C028125001EJP4P1N)[Process][J4801 sensor IC damage]
<rdar://problem/38574345> J680 EVT M25 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0180, Main17 (C0281150013JP501N)[Process][J4800 knock off]
<rdar://problem/39896426> J680 DVT M35 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0180, DES12 (C028181002QJPDF1A)[Process][J4800 cracked]
<rdar://problem/38612123> J680 EVT M25 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0180, Main17 (C028115000WJP501Y)[Process][U6650 solder open]
<rdar://problem/38894440> J680 EVT M25 B_FCT: IEFI DMIC SECURE DISABLE/DMIC 0 PDM SIGNAL POWER@SEP0330, KB1 (C028125001GJP4P1L)[Process][U6650 solder bridge]
<rdar://problem/38816975> J680 EVT M25 B_FCT: IEFI DMIC SECURE DISABLE/DMIC 0 PDM SIGNAL POWER@SEP0330, KB3 (C0281250008JP5G11)[Process][U6650 solder bridge]
<rdar://problem/38450882> J680 EVT M25 B_FCT: IEFI DMIC SECURE DISABLE/DMIC 0 PDM SIGNAL POWER@SEP0330, Main18 (C028112001BJP8D1V) [U6650 Soldering Issue]
<rdar://problem/38496012> J680 EVT M25 B_FCT: IEFI DMIC SECURE DISABLE/DMIC 0 PDM SIGNAL POWER@SEP0330, Main22 (C0281120041JPDF1D)[CND][Suspect U6650 solder insufficient]
<rdar://problem/38646578> J680 EVT M25 B_FCT: IEFI AUDIO DMIC/DMIC 0 PDM DATA FREQUENCY@MIC0180, Main12 (C0281150014JPCM1D) [Material][PCB UMT]

4. Other single failure.

4.1 AMR Lid_open: 检查 hall effect sensor (J4800&J4801)

4.2 DFR Lid_open: 检查DFR相关的元器件（Q5100&U5111&U5104&L5110&L5111）



Slew Rate	2.5V/ms
R(on)	43 mOhm Typ
@ 3.3V	55 mOhm Max
Current	1A Max
Load Cap	22.2uF nom

4.3 SMC ADC sensor check
SMC_ADC2 对应的net是SMC_PBUS_VSENSE：Q5480
SMC_ADC5 对应的net是SMC_GPU_HS_ISENSE：U5990
SMC_ADC6 对应的net是SMC_P3V3_WLAN_ISENSE：Q5530

4.4 USBC power adapter/wait TA_VBUS_20@ADT0370/ TB_VBUS_20@ADT0070 failure. 这种fail item很明确的告诉我们20V VBUS的电有问题可以直接check VBUS线路上的元器件。

<rdar://problem/38699642> J680 EVT M25 B_FCT: IEFI USBC POWER ADAPTER/WAIT TA_VBUS_20@ADT0370, Main5 (C0281170014JP7D10)[Process][cap under QB300]
<rdar://problem/38454092> J680 EVT M25 B_FCT: IEFI USBC POWER ADAPTER/WAIT XB_VBUS_20V@ADT0070, Main18 (C028112003UJP8D16) [CND][Q3200 suspect soldering issue]
<rdar://problem/38778626> J680 EVT M25 B_FCT: IEFI USBC POWER ADAPTER/WAIT XB_VBUS_20V@ADT0070, Main21 (C028117000CJPDF19)[Process][DB500 cracked]

VRAM 不良

Garbage issue

J680目前只有一片garbage的不良板，rework UA400后CND，样本参数比较少。

因为MP使用prod fuse，debug EFI无法install到MLB中
目前维修方法为：

测ICT, 如若pass，则需要rework VRAM one by one。

EG FA

1.量测GPU上电时序，如果电压OK，则在MacEFI输入指令切换EG/IG，确认IG是否正常

GPU上电时序
EN1（EG_VR0_EN）
EN3（EG_VR2_EN）
EN4（EG_VR3_EN）
EN5（EG_VR4_EN）
PP3V3_S0_GPU
PP1V8_S0_GPU_LC_IC
PPVCORE_S0_GPU
PPVDDCI_S0_GPU
PP1V5R1V35_S0_GPU_MEM
GPU_CLKREQ_L
EG_PEG_CLK100M_P
PM_ALL_GPU_PGOOD
GPU_RESET_L
FB_A_RESET_L
FB_B_RESET_L
FB_A0_ZQ
EG_LCD_PWR_EN

EG/IG 切换指令：
1.IG -> EG
OS: input (sudo nvram GfxMode=E) reboot
EFI: input (set AppleOS:GfxMode -x 01 00 00 00) reset -s
2.EG -> IG
OS: input (sudo nvram GfxMode=I) reboot
EFI: input (set AppleOS:GfxMode -x 00 00 00 00) reset -s
3.disable EG/IG in MacEFI
set AppleOS:GfxMode -x 04 00 00 00 (Disable EG)
set AppleOS:GfxMode -x 05 00 00 00 (Disable IG)

Thank you !